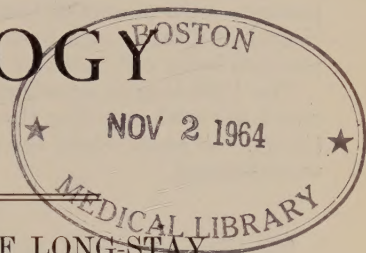


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A DERMATOLOGICAL SURVEY OF LONG-STAY MENTAL PATIENTS.

CECIL B. KIDD, M.B., D.P.M.*

Senior Registrar in Psychiatry

AND

J. CALDBECK MEENAN, M.B., D.P.M.

Registrar in Psychiatry.

Purdysburn Hospital, Belfast.

EARLY in this century it was widely held that the skin of most patients suffering from mental illness was unhealthy. Peterson (1908) viewed certain skin lesions as characteristic of a marked neuropathic disposition and Stoddart (1912) mentioned that seborrhoeic dermatoses and anomalies of pigmentation were particularly common in the mentally ill. A great deal has recently been written on the subject of the "psychocutaneous" diseases and modern experience agrees with that of Lynch (1945) that certain cutaneous manifestations appear to be evidence of psychobiological imbalance. Attention has been focused on the psychiatric implications of dermatological practice (Hall-Smith, 1952; Davies, 1953), but the occurrence of skin diseases in the psychiatric practice of mental hospitals with their select community does not seem to have been reported. On these grounds, a survey was undertaken and it was felt that it might be interesting to define the occurrence of psychocutaneous lesions in a mentally ill population and to assess the skin diseases associated with the infective and dietetic hazards peculiar to institutional life.

INVESTIGATION.

With few exceptions, all cases of mental illness in the city of Belfast of the type requiring in-patient treatment are received into Purdysburn Hospital. The hospital has a bed complement of 1900, and is run on the traditional villa system. To minimize the variable factors concerned with an isolated community, the survey was

* Present address: Medical Research Council Unit for Research on the Epidemiology of Psychiatric Illness, Department of Psychological Medicine, Edinburgh University.

restricted to long-stay patients. For the purposes of this investigation this means those who had been under the care of the hospital for at least a year since the date of their last admission: 1700 patients were considered suitable for inclusion on these terms. In two days, every unit of the hospital was visited and details were noted of the patients' names, age, sex, date of admission and psychiatric diagnosis. The patients were placed in broad psychiatric categories, using the established nomenclature of diseases as a basis. The distribution by sex and diagnosis of the long-stay patients is set out in Table I.

The 1700 longstay patients were systematically examined and all the skin lesions noted were tabulated on the basis of the classification adopted by Hall and Burrows (1957). In cases where the diagnosis was in doubt, the opinion of a dermatologist was obtained.

RESULTS.

The dermatological findings are set out in Table II. The congenital group was made up of cases of cellular naevi and four of ichthyosis. The high figure in the traumatic group was due to the inclusion of fifty-three tattoos, of which eight were seen on female patients. Eighteen extensive burn scars in epileptics added to this figure, and also included were twelve cases of angular stomatitis due to dribbling in mental defectives and to poorly fitting dentures. The remainder of this group consisted of bedsores, ammoniacal dermatitis and three cases of contact dermatitis. Infective conditions included furunculosis, cellulitis, sycosis barbae and one case of herpes zoster. No cases of scabies were found and only one patient had pediculosis. The largest entity in this group was pityriasis versicolor, of which thirty cases were observed. In the neoplastic category, only nineteen patients were affected with common warts, while cases of fibrous intracutaneous naevi, haemangioma, lipoma, and seborrhoeic warts made up the remainder. As there were no cases of epiloia in the mentally defective group, adenoma sebaceum was not seen. The malignant diseases consisted of two basal cell epitheliomata and one mixed parotid tumour involving the overlying skin. The neurodermatoses were selected on the classification suggested by Becker (1947) and here contained one case of neurodermatitis, one of alopecia areata, seven of rosacea, and four of vitiligo. Lichen planus was not observed and pruritus and simple excoriation were not included in the survey. Acne vulgaris accounted for half the cases in the seborrhoeic group. Psoriasis was twice as common in males as in females. There was one case of angular stomatitis due to ariboflavinosis and close examination failed to reveal any dermatological evidence of pellagra or scurvy. Thirty-nine cases of hypostatic varicose conditions were found and apart from the peripheral vascular stasis commonly seen in schizophrenics, there were no other vascular disorders.

DISCUSSION.

The importance of these figures lies in their being representative of the long-stay mentally ill population of an urban community of half a million and can justifiably be considered as an authentic index of present-day trends in

TABLE I.—*Psychiatric Diagnostic Groups.*

	Male.	Female.	Total.
Mental deficiency	184	99	283
Schizophrenic disorders	418	341	759
Arteriopathic disorders	57	169	226
Senile dementias	25	90	115
Presenile dementias	2	9	11
Affective disorders	50	72	122
Alcoholic syndromes	15	6	21
Organic disorders (other than above)	68	70	138
Others	13	12	25
Totals	832	868	1700

TABLE II.—*Dermatological Diagnostic Groups.*

	Male.	Female.	Total.
Congenital	7	7	14
Traumatic (including artefacts)	65	49	114
Infective			
Acute and chronic coccal	8	5	13
Parasitic	1	0	1
Fungal	15	15	30
Viral	0	1	1
Neoplastic			
Simple	28	42	70
Malignant	1	2	3
Eczematous	1	5	6
Allergic (drug rash)	0	1	1
Neurodermatitic	4	9	13
Seborrhoeic	53	20	73
Psoriatic	23	11	34
Hypostatic	28	11	39
Avitaminotic	0	1	1
Totals	234	179	413

this field. Our results show that the traditional belief that the inhabitants of mental hospitals are ravaged by skin disease is unfounded. Only 24% of the patients had skin lesions, a figure which compares favourably with the higher incidence described by Hall and Burrows (1957) in university students in this city. On the whole, distribution of the diseases is comparable with that in the general population and attempts to correlate skin disease to psychiatric diagnosis showed in most groups a broad spread of no statistical significance. This is particularly true for psoriasis, where the patients were representative of most common types of mental illness. Tattooing is rare in women and of the eight female patients five were suffering from general paralysis of the insane and three were schizophrenic girls. Tranquillizers are widely used throughout the hospital but none of the cases of contact dermatitis was caused by these drugs. Warts accounted for only nineteen of the total cases, perhaps due to the absence of children from the survey, but this is a low figure in the light of the finding of Hall and Burrows that the common wart is the most frequently

encountered skin disorder in outpatient practice in Northern Ireland. Scabies is a disease traditionally associated with institutions, overcrowding and low intelligence (Friedman, 1947), and its absence here tends to confirm the views expressed by Graves (1959) that these factors no longer seem to be as important as they were. There has not been an outbreak of scabies in this hospital since 1948, but it will be interesting to observe whether it reappears as the cyclical epidemic unrelated to social conditions predicted by Mellanby (1958). Pediculosis is at times encountered in the admission units, but there was only an isolated case in the long-stay patients, evidence that methods of controlling its spread are effective.

There was only one case of avitaminotic skin disease, a point to be noted because in this hospital a change from departmental cooking to a central kitchen was made four months ago. The experience of other centres has been that such a change may result in skin manifestations of vitamin deficiency, but as Baker (1959) has pointed out, cutaneous evidence of such deficiency may not be apparent before at least six months. It will be interesting to confirm this in a later study.

Valentine (1955) affirmed that the skin was a sensitive indicator of emotional disorder and in particular, rosacea, vitiligo, alopecia areata and neurodermatitis have been attributed to mental stress (Becker and Obermayer, 1947). Butterworth (1938) observed that psychocutaneous diseases were not seen in mental defectives, implying that without a normal affective arc, exteriorization of stress does not occur. Certain categories of mental illness, particularly schizophrenia, are characterized by a pathological decrease in affective response often extending to a state of total emotional withdrawal and in such patients one would not expect to find skin manifestations of psychogenic origin. This group of skin cases, however, accounts for 3% of our series and of the thirteen patients (four male, nine female) all but one arteriopathic psychotic were suffering from schizophrenia. Emotional trauma, tension, fatigue and the menopause are stressed by MacKenna (1944) and Berlin (1958) but could not be implicated here and enquiry revealed that no patient with rosacea had special access to hot tea (Ingram, 1959). Macalpine (1958), finding alopecia areata in low grade imbeciles, has questioned "psychic trauma" as the aetiological agent. We feel that our findings add to the evidence that mental stress is a factor in the neurodermatoses rather than their cause.

This survey shows that the dermatological problems of mental hospital patients differ little from those of the general population. It is, however, important to realize that mental illness is often characterized by a low level of personal and environmental awareness in the patient and skin lesions which annoy the normal person often go unnoticed by the mentally ill. The vigilance of the nurse and the personal hygiene of the patient are therefore both essential in controlling skin disease in mental hospitals.

SUMMARY.

One thousand, seven hundred long-stay mental patients were investigated and 413 (24%) were found to have skin diseases. The importance of these figures lies in their being representative of the mentally ill in a large urban population.

Breakdown into sex and diagnostic groups showed distributions similar to those in the general population. Attempts to correlate skin disease and psychiatric diagnosis showed no statistical significance.

The significance of psychocutaneous manifestations occurring in emotionally unresponsive patients is discussed.

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THE NEURODERMATOSES AND INTELLIGENCE.

CECIL B. KIDD, M.B., D.P.M.,*

Senior Registrar in Psychiatry

AND

J. CALDBECK MEENAN, M.B., D.P.M.

Registrar in Psychiatry.

Purdysburn Hospital, Belfast.

THE extent to which emotional stress is a factor in the aetiology of skin diseases has been for long a popular source of speculation. It is recognized that the skin is a sensitive indicator of emotional disorder (Valentine, 1955) and until recently the opinion held by most authorities has been that at least certain groups of skin lesions are of psychogenic origin, representing an expression of psychobiological imbalance (Lynch *et al.*, 1945). These "psychocutaneous" lesions, collectively grouped as the neurodermatoses, have been described by Bethune (1960) as evidence of maladjustment in the patient to the environment.

Recently some evidence has been presented that mental stress may be a factor in the neurodermatoses rather than their cause. Macalpine (1958) questioned psychic trauma as the cause of alopecia areata when reporting its occurrence in low grade imbeciles. Borrie (1959) took the view that few skin diseases were actually induced by psychological mechanisms, but that emotional factors played a part in prolonging or aggravating such lesions. In a recent dermatological survey of mental patients (Kidd and Meenan, 1961) it was found that neurodermatoses occurred in schizophrenic patients who exhibited a decreased affective response. These patients were pathologically incapable of expressing or repressing emotion and it was consequently found hard to implicate stress mechanisms in the causation of their skin lesions.

To pursue this study further it was felt that it might be interesting to define the occurrence of "psychocutaneous" diseases in a mentally defective population, where impairment of psycho-physiological mechanisms is clearly recognized. If in fact these diseases represent somatization of stress response, then a low incidence might reasonably be expected here and their occurrence should correlate with the severity of the mental defect, since people of very low intelligence do not readily repress emotion.

INVESTIGATION.

Seven hundred hospital patients (376 male, 324 female), designated by Act of Parliament as requiring "Special Care", were systematically examined for evidence of the neurodermatoses. The latter were selected on the classification suggested by Becker and Obermeyer (1947), with the exception that pruritus and simple excoriation

* Present address : Medical Research Council Unit for Research on the Epidemiology of Psychiatric Illness, Department of Psychological Medicine, Edinburgh University.

were not included in this survey. To minimise the variable factors concerned with such a select population, the patients were chosen from a broad span of age groups from infancy to senility and the extent of their mental deficiency varied from that of the high grade feeble-minded to that of the low grade idiot.

Where a diagnosis of a neurodermatosis was made, details were noted of the patients' names, age, sex, psychiatric diagnosis and intelligence grading. The grading categories I, II and III indicate respectively moron (I.Q. 70-50), imbecile (I.Q. 50-20) and idiot (I.Q. less than 20). The sub-categories indicate a descending order of severity within the grade; thus a patient in grade Ia is a borderline defective able to manage his affairs with some supervision, while one in grade IIIc is a non-ambulant defective, incapable of any comprehensive form of expression or communication.

RESULTS.

Seventeen patients (ten male, seven female) were found to have a neurodermatosis. The distribution of these cases by sex, dermatological diagnosis and psychiatric category are set fourth in Table I.

TABLE I.—*Distribution of Cases by Sex, Dermatological Diagnosis and Psychiatric Category.*

Sex	Dermatological diagnosis	Psychiatric diagnosis	Intelligence grade
M	Neurodermatitis*	Juvenile schizophrenia	Ia
M	Rosacea	Primary amentia	Ic
F	"	Oligocephaly	Ic
F	Lichen planus	Primary amentia	Ic
F	Vitiligo	" "	Ic
M	Alopecia	Mongoloid amentia	IIa
M	"	" "	IIa
F	Rosacea	Primary amentia	IIa
M	Alopecia	" "	IIb
M	Vitiligo	" "	IIb
M	"	Birth injury, epilepsy	IIb
F	"	" " cerebral palsy	IIb
M	"	Primary amentia	IIb
F	Rosacea	Mongoloid amentia	IIc
M	Neurodermatitis†	Primary amentia	IIIb
F	Alopecia	Mongoloid amentia	IIIb
M	"	Birth injury, epilepsy	IIIc

*† Lichen simplex chronicus.

There were five cases each of vitiligo and alopecia areata, four of rosacea, two of neurodermatitis (lichen simplex chronicus) and one of lichen planus. All age groups were widely represented. Five of the patients were classified in grade I of mental deficiency, nine in grade II and three in grade III. The psychiatric groups were made up of eight primary aments, four mongols, three birth injuries, one oligocephalic and one retarded juvenile schizophrenic.

DISCUSSION.

Mental defectives, particularly morons, are prone to neurotic reaction (Curran and Partridge, 1957), and Tredgold (1947) has commented that emotional disturbance in patients of low intelligence is typically shortlived and usually present in the form of overt anxiety or hysterical reaction.

At this low level of intelligence it would be expected that emotional repression and stress somatization would be minimized, yet it is seen that 2.4% of the seven hundred patients examined showed skin disorders commonly attributed to psychological factors.

The occurrence here of alopecia in low grade mental defectives supports the suggestion of Macalpine (1958) that stress is an unlikely causative agent. Vitiligo however does seem to have been regarded as having psychological significance (MacKenna, 1944; Berlin, 1958) and it is interesting that in this series five cases were observed in morons and imbeciles. Inquiry into the four cases of rosacea revealed that they had no special access to hot tea (Ingram, 1959) and similarly it would be difficult to indict psychological mechanisms in these and the other neurodermatoses found.

In this series there is no correlation between the occurrence of the neurodermatoses and age, psychiatric category, or level of intelligence. The male:female ratio and the overall incidence of the neurodermatoses in this mentally defective population does not essentially differ from that described for the general population (Becker and Obermeyer, 1947).

This investigation tends to support the view that psychological factors are not of over-riding importance in the aetiology of the neurodermatoses.

SUMMARY.

Seven hundred mentally defective patients were investigated and 17 (2.4%) were found to have a "neurodermatosis".

Breakdown into age, sex and diagnostic groups showed distributions similar to those in the general population. Attempts to correlate neurodermatosis and level of mental defect showed no significant relationship.

These findings are presented as further evidence that stress is a factor in the neurodermatoses rather than their cause.

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PSYCHOSOMATIC ASPECTS OF ROSACEA

F. A. WHITLOCK, M.D., M.R.C.P., D.P.M.

Consultant Psychiatrist, Newcastle General Hospital, Newcastle-upon-Tyne.

A SPECIFIC cause for rosacea has not been satisfactorily demonstrated. Indeed, it is probable that no single factor is responsible and what appears to be of significance in one patient has little bearing on the problems of another. Reviews by Søbye (1950), Beerman (1956) and MacKenna (1958) deal comprehensively with the facts and theories.

The clinical appearance of rosacea needs no detailed description. The distribution of the eruption requires some comment as it is commonly stated that the blush areas are involved although it is clear that areas of skin affected by rosacea and by blushing are by no means identical. The cheeks, nose, chin and forehead are most usually involved by rosacea and I have not personally seen it on the neck or chest, areas commonly affected by emotional blushing. Certainly none of the fifty cases to be described in this paper had lesions on areas other than the face and forehead. As the supporters of the psychological causation of rosacea make much of the distribution of the dermatosis, relating it to emotional blushing for unconscious reasons, it is as well to point out that the evidence for this hypothesis derives little confirmation from clinical observation.

In the absence of a satisfactory explanation of a dermatosis, psychological factors are often invoked to account for it and many regard rosacea as a psychosomatic disorder. Stokes and Beerman (1932) and Klaber and Wittkower (1939) were strong supporters of this opinion although Beerman (1956) in his more recent review was less certain. Klaber and Wittkower asserted that feelings of guilt and shame mainly over sexual problems and social anxiety played a great part in the aetiology of rosacea. They described a personality who was anxious to please others, who feared to attract attention and who was troubled by strong feelings of inferiority, guilt and shame. They commented particularly on the fears these patients had of social contacts, their avoidance of social occasions and their sensitivity to criticism whether genuine or imaginary. They also commented on their patient's preoccupation with sexual guilt and their apparent lack of interest in sexual activity. They noticed that the onset of the rosacea was preceded by acute or chronic psychological trauma in the majority of their patients, such trauma usually being sexual or social. Their patients were quiet and reserved, modestly dressed, anxious to please, with a marked desire to avoid the limelight on all possible occasions.

Plesch (1951) carried out a Rorschach study of fifty cases of rosacea and morbid blushing, the numbers of each affliction not being stated. From the results he obtained he felt that these patients showed extensive castration and homosexual phantasies which were negligible among the controls. Paranoid signs were also more frequent in patients than in the controls. Plesch comments that the findings do not seem to be specific for rosacea as they are common to other psychosomatic disorders.

White, Jones and Ingham (1956) carried out a Rorschach study of the "neurodermatoses" among which was included a group of patients with rosacea. They found that the cases of rosacea showed evidence of immaturity when compared with cases of dermatitis artefacta and other dermatoses and that rosacea gave the most abnormal responses. They summed up the results of their findings in rosacea by asserting that their patients showed an immature reaction to life with infantile but strongly inhibited affective responses. All adjustments seemed poor and neurotic trends marked. Hostility features were relatively low. From their clinical examination they found that rosacea patients presented a history of lifelong social maladjustment and marked emotional inhibition. They were immature, shy and inadequate, lacked self-confidence, were dependent, blushed easily and were ill at ease in a social setting.

It is impossible to apply these findings to rosacea cases in general as the patients were referred for specific psychiatric reasons and were not selected at random. The relationship of the psychiatric symptoms therefore, to the dermatosis is uncertain and it would be unjustifiable to assume that these results have any bearing on the problem of rosacea in the general population. Opinions differ on the validity of the Rorschach test but it is perhaps fair to comment that a test which obtains the most "normal" responses from such abnormal personalities as those suffering from dermatitis artefacta is, to say the least, suspect.

Clinical experience derived from dermatological practice did not support the findings which have been described. Clinical impressions, however, are notoriously unreliable and a small number of patients was seen for psychiatric examination. Apart from obtaining the life histories of these patients they were questioned closely about their attitudes to social contacts and activities, their sexual development and experience, their emotional reactions and their feelings about their dermatosis. Symptoms of social anxiety were looked for with particular care. Contrary to expectations, all of this small group of patients appeared positively to enjoy a party where they mixed with friends and strangers. None of them showed abnormality or inhibition of sexual activity and none showed shame, guilt or embarrassment when discussing this topic. Some were a little self-conscious of their facial appearance but none allowed this fact to interfere with their normal social activities. Admittedly

the number seen was small and no positive opinions could be derived from the study. But as the problem of the psychogenesis of rosacea seemed undecided, a more extended study was indicated. It is with the examination and comparison of fifty other cases of rosacea with fifty control cases suffering from a variety of dermatoses that the remainder of this paper is concerned.

INVESTIGATION.

Twenty male and 30 female cases of rosacea were examined. Controls taken from patients attending a dermatological out-patient clinic with a variety of skin disorders were matched for age and sex. The purpose of their visit was explained to all patients and all were subjected to the same procedure. A full life history was obtained, particular attention being paid to details of social relationships and to the presence or absence of anxiety in social situations. Sexual development and activity were fully discussed and the patient's reaction to this discussion was noted. Having been assured of the confidential nature of the interview, no difficulty was experienced in obtaining the necessary information without encountering, in the great majority of cases, any obvious embarrassment.

The interview was supplemented by asking the patient to complete the Maudsley Medical Questionnaire (Eysenck, 1947) to which were added six additional questions (Nos. 41-46) relating to certain features thought to be of significance in cases of rosacea.

MODIFIED MAUDSLEY MEDICAL QUESTIONNAIRE.

Please read through these questions and underline the correct answer, either "Yes" or "No". Do not omit any item.

1. Do you have dizzy turns ?
2. Do you get palpitations or thumping in your heart ?
3. Do you ever have nervous breakdowns ?
4. Are you off work through sickness a good deal ?
- * 5. Do you often get "stage fright" ?
- * 6. Do you find it difficult to get into conversation with strangers ?
7. Are you ever troubled by a stammer or a stutter ?
8. Have you ever been made unconscious for two hours or more by an accident or blow ?
9. Do you worry too long over humiliating experiences ?
10. Do you consider yourself rather a nervous person ?
- * 11. Are your feelings easily hurt ?
- * 12. Do you usually keep in the background on social occasions ?
13. Are you subject to attacks of shaking or trembling ?
14. Are you an irritable person ?
15. Do ideas run through your head so that you cannot sleep ?
16. Do you worry over possible misfortunes ?
- * 17. Are you rather shy ?
18. Do you sometimes feel happy, sometimes depressed without any apparent reason ?
19. Do you daydream a lot ?
20. Do you have as much life about you as others ?
21. Do you sometimes get a pain over your heart ?
22. Do you have nightmares ?
23. Do you worry about your health ?
24. Do you sometimes walk in your sleep ?
25. Do you sweat a great deal without exercise ?
- * 26. Do you find it difficult to make friends ?
27. Does your mind wander badly, so that you lose trace of what you are doing ?
- * 28. Are you touchy on various subjects ?
29. Do you often feel disgruntled ?
30. Do you often feel miserable ?
- * 31. Do you often feel selfconscious in the presence of superiors ?
32. Do you suffer from sleeplessness ?
33. Do you get short of breath without doing heavy work ?

34. Do you suffer from severe headaches ?
35. Do you suffer from " nerves " ?
36. Are you troubled by aches and pains ?
37. Do you get nervous in places such as lifts, trains or tunnels ?
38. Do you suffer from attacks of diarrhoea ?
- *39. Do you lack self-confidence ?
- *40. Are you troubled with feelings of inferiority ?
- *41. Do you blush easily ?
- *42. Do you enjoy parties and social gatherings ?
- *43. Do you enjoy the company of members of the opposite sex ?
- *44. Does your skin interfere with your life ?
- *45. Do you regard the physical side of sex as unpleasant or shameful ?
- *46. Do you worry excessively about minor misdeeds in the past ?

* Questions relating to symptoms of social anxiety.

From a study of this questionnaire designed to elicit a general factor of neuroticism, it is clear that certain questions have a greater bearing on social anxiety as a symptom than others. It could be argued that there is a social component in most neurotic symptoms and that there is little justification for selecting some questions and rejecting others. However, for the purpose of this investigation where social anxiety has been considered of major importance, it seemed reasonable to make this differentiation.

RESULTS.

MALES : 20 cases were seen matched for age and sex with 20 control cases who had the following dermatoses : 11 of eczema and dermatitis, 7 of psoriasis, 1 of lupus vulgaris and 1 of ringworm of the nails.

Rosacea cases : The clinical symptoms were of all grades of severity but none showed ocular involvement. Their ages ranged from 26 to 58 years with an average of 40. Seventeen were married and three single. The duration of the dermatosis varied from three months to nineteen years.

Ten cases were classed as psychiatrically normal, being devoid of any obvious psychiatric symptoms. Three patients showed mild and three fairly severe anxiety symptoms, one patient was an epileptic, two showed mild obsessional features and one patient was an alcoholic.

When attempting to relate the onset of the rosacea to preceding acute, chronic, or recurring emotional trauma it was possible to do so in only two cases. Although many of the others had had neurotic symptoms of varied degree, the relationship to the onset of the dermatosis was obscure.

On the questionnaire, figures for positive responses to questions concerned with social anxiety (SA) varied from 0-13 with an average of 5.4. For those dealing with neuroticism (N) the scores varied from 0-12 with an average of 4.45. The highest figure, SA 13 and N 12, was scored by a single, 33-year-old epileptic who had had rosacea for two years. Although it could be said that the end of a half-hearted courtship causing no great disturbance was related to the onset of his rosacea, it is more probable that increasing consumption of beer over the preceding years had more to do with it than any emotional

upheaval. The lowest score came from a jovial carpenter who looked and sounded in excellent health and spirits. He scored zero in each category. A close second was a mild alcoholic who scored 1 in the SA category.

The following abbreviated case histories are of the two men in whom emotional factors were thought to be of aetiological significance.

(i) A 31-year-old married coal miner had had rosacea for 3 years. He was physically fit but showed mild anxiety symptoms. Five years previously he had had to give up a better job to which he had recently been promoted owing to an anxiety neurosis. His rosacea developed at about the time of the birth of his first child and there was a flare-up of the condition after the birth of his second child nine months before the interview. He recalled feeling extremely anxious for the safety of his wife during labour, admitting that he was very dependent on her, regarding her as a mother as much as a wife. There was evidence of sexual inhibition before marriage at the age of 22 but the marriage had been happy and sexual relations normal and satisfactory. Socially he mixed little but said he quite enjoyed social occasions. On the questionnaire he scored SA 8 and N 5. It seems possible that the upsurge of anxiety at the end of each pregnancy and a rather shame-faced awareness of his own weakness in a society where masculine independence is extolled was responsible for the onset of his rosacea.

(ii) A 48-year-old married civil servant in the clerical grade had had rosacea for about three years. It had been worse for the preceding six months. He was physically fit apart from his dermatosis and partial loss of sight in one eye due to a retro-bulbar neuritis at the age of 20. He had been in the civil service for 23 years and did not marry until the age of 42, after the death of his mother. He chose a woman one year older than himself, also a civil servant in the same government office, but in a higher grade than his own. The marriage had been happy and although he had shown no interest in women before his marriage the sexual relationship was satisfactory. Psychiatrically he showed mild obsessional and anxiety features. For the past few years he had been worried about his lack of drive and failure to achieve promotion. He felt that his lower status compared with his wife's was invidious and wished that the position was reversed. There had been no children of the marriage and for the past six months his wife had had menopausal symptoms. The patient expressed some concern over these. Throughout his life he had been solitary and retiring, with few friends. He was of a serious disposition and regarded life as a melancholy business. Nevertheless he was not depressed and talked easily about his feelings. He felt that frustration over his lack of promotion was something to do with his rosacea. On the questionnaire he scored SA 13 and N 11. Undoubtedly this patient's personality conformed closely to that described by Klaber and Wittkower and it is probable that his feelings of frustration and resentment about his work coupled with his childlessness had much to do with the onset of the rosacea. His wife's menopausal symptoms had put an end to his hopes for a child of his marriage and he felt that the future was likely to be one of continued failure.

Control cases : Of these 20 men 10 were married, 9 single, and 1 widowed. The duration of their dermatoses varied from three weeks to forty years. Psychiatrically, six were normal, four showed mild and three severe anxiety symptoms, four had personality disorders of various kinds and three showed mild obsessional traits.

Applying the same criteria for psychological causation it appeared that there was no emotional disturbance to cause the dermatosis in 17 cases. In the other

three, the outbreak or exacerbation of the skin disorder had been preceded by some significant emotional disturbance which could be considered causative.

On the questionnaire, the scorings for social anxiety varied from 0-11 and for neuroticism from 0-12. The average figures were 5.8 and 5.35 respectively. The highest score, SA 11 and N 11, was obtained from a 35-year-old married man who had had psoriasis since the age of three. He appeared to be a hostile, irritable man with some evidence of general and social anxiety symptoms. He felt that his skin condition had interfered with his enjoyment of life and he resented this restriction bitterly. The lowest score, SA 1 and N 0 came from a 44-year-old unmarried man with psoriasis for twenty years. He appeared unconcerned by his dermatosis and despite mild obsessional features showed no evidence that any emotional factor was of aetiological significance.

FEMALES : 30 cases were seen matched for age with thirty control cases suffering from the following dermatoses: 10 of psoriasis, 4 of eczema, 5 of lupus erythematosus, 3 of varicose ulcer, 2 of alopecia areata and 6 of miscellaneous conditions.

Rosacea patients : The clinical state of the patients varied from a minor degree of erythema with slight papule formation to fairly severe involvement of the whole face. The ages ranged from 16 to 75 years with an average of 43. Twenty patients were married, two widowed and eight single. The duration of the dermatosis varied from three months to thirty years.

Psychiatrically, 22 of the patients were classed as normal and free from any obvious psychiatric symptoms. One patient was of borderline defective intelligence, 2 showed mild and 5 fairly severe anxiety symptoms. On the questionnaire, the range for positive responses for social anxiety varied from 0-11 and for general neuroticism from 1-13. The mean for each score was 4.2 and 6.5. The highest score, SA 11 and N 15 was given by a 30-year-old married woman who had had rosacea for 6 years. She showed fairly severe symptoms of an anxiety state. Rosacea began after the birth of her second child and although it was not severe, there were premenstrual exacerbations. She had been married for ten years, had two children and described the marriage as, happy. Sexual relations were normal and satisfactory. She enjoyed company provided she was visited and did not have to go out. She admitted that she felt some embarrassment due to her skin condition. She had noted that heat and postprandial fulness seemed to make her rosacea worse. She did not feel that the second pregnancy, which was uneventful and wanted, had caused any emotional disturbance.

The lowest score, SA 0 and N 2, was given by a 38-year-old married woman with rosacea for four years. The dermatosis was fairly severe and appeared to be aggravated by heat. She had had an operation for varicose veins shortly after the onset of the dermatosis and was told that this would improve her face. She had been happily married for twelve years, had two children, and sexual

relations were normal and satisfactory. She led an active social life which she enjoyed. She admitted to experiencing some slight embarrassment due to the appearance of her skin but she used cosmetics to cover it up.

Of the 30 patients seen, it was possible to relate the onset to disturbing emotional events in 6 cases. Following are the abbreviated case histories of these 6 patients.

(i) A woman, married for two and a half years, without children and working as a clerk, had had rosacea for three months. She had a fear of pregnancy, the marriage was unhappy, she was frigid and found sexual relations distasteful. The onset of the rosacea—which was slight—coincided with her awareness that she was becoming attracted to a man who worked in her office. She felt that, despite her unhappy marriage, she could not face the scandal of a divorce. She set great store by social rectitude, regarding her husband as being of lower social status than herself. She had had another previous engagement and had had serious doubts about marrying her present husband. She went through with it rather than face the social consequences of another broken engagement. On the questionnaire she scored SA 11 and N 8. She talked without embarrassment about her problems and felt that her rosacea had come on as tension between her husband and herself had increased over the preceding months.

(ii) A married woman, aged 34, began to have rosacea sixteen years earlier when she had an illegitimate child. The dermatosis had waxed and waned over the subsequent years but became worse with each succeeding pregnancy. She was now in the fourth month of her seventh pregnancy. Shortly after her first pregnancy she married, and while her husband was away in the army she had an affair and had another child. Her husband had adopted both of these children and, not surprisingly, brought this up against her, particularly when he had been drinking. The marriage was not very happy but she felt that she had to make it work. She looked back with shame upon her illegitimate pregnancies and felt that everyone in her village knew and commented upon them. These feelings increased with each succeeding pregnancy. On the questionnaire she scored SA 6 and N 11. The clear-cut relationship of relapses of her rosacea with each succeeding pregnancy suggested that her feelings of shame and regret about her initial mishap had a bearing upon the dermatosis. However, it would not be possible to rule out endocrine changes as being of equal, if not greater, importance.

(iii) A single woman aged 45, a housekeeper, had had rosacea for 18 months. She had had two mental breakdowns in the past, presumed anxiety states with depression, and showed fairly severe anxiety symptoms at the time of interview. She appeared to have had a variety of neurotic symptoms throughout her life. She had lived with her mother until the latter died three years ago. Between the death of her mother and the onset of her rosacea she had had three short-lived, casual sexual adventures. She felt it was "now or never" but regretted the last one which she described as sordid, feeling that she had let her mother's memory down and cheapened herself. Since then she had been unhappy, anxious and self-reproachful. Not surprisingly, this woman, who had had a very sheltered life, thought that her rosacea was a manifestation of venereal disease. On the questionnaire she scored SA 7 and N 13.

(iv) A married woman aged 53 had had rosacea for five years. The onset was described in dramatic terms, a violent emotional episode in which her son's mother-in-law, with whom she was on bad terms, had assaulted the patient verbally and physically in the street. By some mischance this woman had discovered that the patient's son was illegitimate and screamed out this information to the interested neighbours while she clawed the patient's face with her finger-nails. The patient thought that

she might have been infected by her assailant. As a result of this episode, the patient was ostracized for a long time by her neighbours and she felt ashamed of her past life. She wished she could move away from the neighbourhood and from the proximity of her foul-mouthed relative who still lived in an adjoining flat. Despite this horrible experience, she seemed a jolly woman who appeared to have some insight into the possible cause of her dermatosis. She scored SA 1 and N 7 on the questionnaire.

(v) A married woman aged 54, who had had three attacks of rosacea. The first attack began in January 1956 after the death of her mother-in-law from, in all probability, pemphigus and a senile psychosis. The patient had nursed her from a sense of duty. She disliked her mother-in-law and feared her skin condition was contagious. She was somewhat ashamed of her fear. She had also been involved in nursing her husband's uncle who had died in December 1955. She was shocked by his sudden death. Some years previously she had nursed her mother-in-law's sister who had died also, possibly, from pemphigus. She had given birth to her son after this and the patient then had fears of infection. Her second attack of rosacea lasted from February 1957 to June 1958. There did not appear to be any precipitating factor in this attack. In December 1957 her own mother fell ill and was nursed by the patient until her death in August 1958. At the same time her second son married and the patient had a perforated duodenal ulcer. It should be added that in 1955 she had attacks of spastic colitis while nursing her mother-in-law and that her mother-in-law had to go to hospital until the patient recovered and could take over the nursing once more. The third attack began in February 1959 when she was worried about her elder son and about the ill-health of her sister who, she feared, might become yet another nursing burden for her to carry. She described her sister in rather disparaging terms as "nervy, she lets herself go whenever she gets run down". The patient appeared to be a competent, busy woman without evidence of psychiatric abnormality. Her marriage was happy but she had noticed some loss of libido since a hysterectomy some 6 years previously. She admitted her feelings of resentment at having to carry far more than her fair share of the nursing burdens of her family even when she was ill herself. She felt that such feelings were unworthy and she was mildly self-reproachful. On the questionnaire she scored SA 7 and N 6.

(vi) A married woman aged 57 with rosacea for 3 years. She had been reasonably happy in her marriage for 36 years but admitted that sexual relations had never been satisfactory as she was frigid and experienced dyspareunia. She was married to a solicitor and had one son aged 31. She had lived in London until she moved north some eight years ago. She felt that she had never adjusted to her surroundings and missed her former friends. Some two years after moving she became aware that the structure of her new house was defective and she feared it might collapse. She told her husband of her fears but he refused to listen to her. She then learned that despite his professional experience her husband had failed to have the house surveyed before purchase. It was eventually discovered that the house was in fact sinking owing to undermining by a local coal pit. At considerable cost and after the publicity of a court case the house was eventually repaired about four years ago. She said she had not since felt at ease in the house and she had been exposed to a fair amount of "friendly" comment from her neighbours who realised her husband's mistake. The patient was a pleasant woman with some anxiety symptoms. She described the experience with some feeling of resentment towards her husband whom she had had to defend publicly for a mishap for which she blamed him and which had led to a certain amount of friction between them. She scored SA 3 and N 14 on the questionnaire.

Control Cases : Of the 30 patients seen, 17 were classed as normal and free from psychiatric symptoms. Nine had anxiety symptoms of varied degrees of severity, three were moderately depressed and one showed fairly marked

obsessional traits. Nineteen patients were married, five widowed and six single, the marital status differing little from that of the rosacea patients.

On the questionnaire, the range of positive N responses varied from 0-16 with a mean of 6.8 and for positive SA responses the range was from 1-14 with a mean of 5.9. These figures do not differ significantly from those scored by the rosacea patients. The highest score was obtained from a 73-year-old widow with an ulcer on her leg, who had a fairly severe anxiety state and who scored SA 12 and N 16. The lowest score was given by a 33-year-old married woman with psoriasis. In this patient it seemed possible that a cluster of upsetting domestic events had a bearing on a sudden exacerbation of her psoriasis.

DISCUSSION.

One of the points to be considered is the concept that rosacea patients have a set of personality traits peculiar to themselves. This concept has been postulated for a wide variety of psychosomatic conditions and recent work has cast doubt upon the validity of the hypothesis. It was in order to test this belief that the questionnaire was used, dealing as it does with a number of traits—indicating social anxiety as well as indicating the presence of the general factor of neuroticism. The results obtained from the questionnaire have been analysed and are set out in Table I.

TABLE I.—*Analysis of Questionnaire Scores.*

Female Rosacea Cases.		N	SA
Mean scores for all rosacea cases (30)		6	4.2
Mean scores for cases of rosacea where psychological disturbance was not of aetiological significance (24)		5.5	4.0
Mean scores in patients where psychological disturbances were of probable aetiological significance (6)		9.5	5.8
Mean scores of rosacea patients with anxiety symptoms (7)		10.0	5.1
Female Control Cases.			
Mean scores of patients with anxiety symptoms (9)		10.2	9.0
Mean scores of patients without anxiety symptoms (21)		5.0	4.7
Male Rosacea Cases.			
Mean scores of all rosacea cases (20)		4.5	5.4
Mean scores of cases where psychological disturbance were not of aetiological significance (18)		4.0	4.8
Mean scores of patients where psychological disturbances were of probable aetiological significance (2)		8.0	10.5
Mean scores of patients with anxiety symptoms (6)		6.8	9.6
Male Control Cases.			
Mean scores of patients with anxiety symptoms (7)		7.7	7.3
Mean scores of patients without anxiety symptoms (13)		4.0	5.0

From a study of this analysis a number of facts can be deduced. In the first place it is clear that overall scores of male and female rosacea patients differ in no significant way from those obtained by the controls. In those rosacea

patients where psychological determinants for the disease appeared absent, the scoring approximated to the results obtained from controls without anxiety symptoms, but in those patients whose rosacea seemed to be psychogenic, the scores were closer to both rosacea and control groups with anxiety symptoms. Too much should not be made of this observation as two of the female and both of the male rosacea cases which were possibly psychological in origin had mild anxiety symptoms at interview. The numbers are small in each group but the overall results are not necessarily invalid on that account. Why the female control cases with anxiety symptoms should score so much higher in the social anxiety questions than the comparable group in the rosacea patients is not clear ; but at least it demonstrates that social anxiety symptoms are not peculiar to rosacea patients when compared with other dermatoses and that this particular set of personality characteristics have no real relationship to rosacea or, so far as this investigation goes, to any other skin disorder. It seems probable, therefore, that where previous investigators have described certain personality traits in their patients they were in fact observing more general features of neuroticism, features which are more marked in those patients where a psychological causation for rosacea is suspected.

If it is accepted that there is no specific "rosacea-personality" it remains to be seen how far the dermatosis can be caused by emotional disturbance, whether acute or prolonged, before the onset of the dermatosis. As in all other psychosomatic work, one runs immediately into the difficulty of establishing in any certain way the causal linkage between psychological event and subsequent physical change. Where it is possible to establish that a particular type of emotional experience is traumatic and when such an event when repeated is followed by recurrence of disease symptoms it is reasonable to postulate that a causal linkage exists. Acute and severe emotional trauma followed by a physical change allow one in some instances to assume that the change has been psychologically determined. We are on less certain ground when the emotional experience has been prolonged and when only after a fair period of time do physical symptoms develop. It is in such circumstances that one asks whether the physical illness has some symbolic meaning which can link it to the preceding emotional experience. MacKenna and Macalpine (1951) have warned us of the dangers of reading too much significance or symbolism into skin symptoms. In popular parlance, to be sure, we itch with fury. But we are also said to itch with curiosity. Nobody to my knowledge who has related unconscious feelings of rage and hostility to itching has suggested that failure to satisfy our curiosity can cause identical symptoms.

Rosacea, on the other hand, is not an itchy dermatosis. Many of the patients seen complained of burning of their skin but none said that they itched. If Cormia's (1952) view that all psychosomatic skin diseases itch is acceptable, the absence of itching in rosacea might be one reason for rejecting it as a psycho-

somatic disorder. If, however, itching is a nonspecific symptom devoid of any symbolic meaning, it does not necessarily follow that redness and burning of the face come into the same non-specific category. In the eight cases described where psychological factors seemed to be of importance, two emotions appeared to be uppermost; a sense of social shame coupled with some feeling of resentment and injustice. If one wishes to use "organ language" one could say that these patients experienced a "loss of face". Such an interpretation of symptoms agrees closely with the postulates of Klaber and Wittkower. The difference between us lies in my failure to find any specific personality pattern and in the far smaller number of cases in whom psychological causation seemed likely.

It has been suggested that the dynamics of rosacea are similar to those of morbid blushing. Admittedly many cases of rosacea blush easily and are embarrassed by doing so. In this study, however, rather more controls, 19 women and 9 men, admitted to blushing easily compared with 14 women and 7 men in the rosacea group. Some of these controls showed anxiety symptoms with their blushing but none showed the specific complex of symptoms designated by the term, erythrophobia. As in my experience, no case of this condition has shown symptoms of rosacea, it seems probable that the two disorders are separate entities.

If this study indicates that psychogenesis is not of major importance to the development of rosacea it has to be admitted that it throws little light on the cause or causes of the disease. A few points should be made: rosacea affects, predominantly, those areas of the face where sebaceous gland activity is greatest, where vascularity is marked and where there is maximal exposure to light. Many of the patients commented that physical factors such as heat, cold and strong sunlight seemed to make matters worse. A smaller number noted the adverse effects of postprandial fulness and flushing but that avoidance of the traditional enemies—hot tea, pickles and spices—had made little difference to their appearance. In only two cases did excessive consumption of alcohol appear to be of significance. Increased vasodilation associated with endocrine changes seemed to be of importance in some female patients.

The use in this study of other skin patients as controls can be criticized on the grounds that such a group would—and did—contain a number of patients with psychological disorders related to their dermatoses. However, as the control group was used mainly to check on the theory of a specific rosacea personality, it appeared adequate to show that no such specificity could be delineated. The control group, of course, does not invalidate the hypothesis that in some instances rosacea is psychogenically determined. In this study, eight cases out of fifty showed features compatible with this concept. One can not, therefore rule out psychogenic factors in this dermatosis but it is probably incorrect to say that these are operative in more than a minority of

patients. Constitutional endowment, endocrine and metabolic disturbances all seem to be of significance and it is against this background that the contribution of emotional disturbances must be assessed.

SUMMARY.

The literature concerned with the supposed psychogenesis of rosacea is reviewed and reasons are given for suggesting that further study was needed before this hypothesis could be accepted.

Thirty female and 20 male patients with rosacea were examined and compared with equal numbers of control cases, matched for age and sex, suffering from various skin conditions. Both groups were asked to complete a questionnaire after a full psychiatric and dermatological case history had been obtained.

Of the 50 rosacea patients seen, in only six women and two men was it considered that their dermatosis had been precipitated by preceding emotional disturbances.

There was little difference between the questionnaire scores of the two groups and it was not possible to support the view that rosacea patients have a personality structure peculiar to sufferers from this disease.

It is concluded that rosacea is a non-specific reaction precipitated by a variety of stimuli and that only in a minority of patients could psychological factors be considered of importance.

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THE TREATMENT OF ACNE VULGARIS WITH TOLBUTAMIDE.

F. RAY BETTLEY, M.D., F.R.C.P.

Physician for Diseases of the Skin, Middlesex Hospital, London.

COHEN and Cohen (1959) recorded the use of tolbutamide in the treatment of acne vulgaris. They treated twenty-six cases resistant to other treatment and obtained improvement in all of them. Because of this report a double-blind clinical trial was designed and the results are given below.

SUBJECTS.

Thirty-five consecutive unselected patients attending with acne vulgaris were started on the trial: a few defaulted so that satisfactory records are available in 30 cases. Of these patients 12 were male and 18 female. Their ages ranged from 14 to 33. None had glycosuria. The degree of acne was recorded as "mild" when lesions were few, small and mainly papular, "moderate" when lesions were larger and with more pustules and "severe" when there were many pustules. Five patients were classed as severe, 19 moderate and 6 mild. Some were already using dietary or local treatment: if so, this was continued. Otherwise, no other treatment was given during the period of trial.

TREATMENT.

Tablets of tolbutamide 0.5 g., of sulphamethoxypyridazine (SMP) 0.5 g., or of lactose 0.5 g. were given twice daily for a month each. They were given in random order and the order in which they were given in an individual patient was not known until the conclusion of the entire trial. Results were assessed at the end of each month by the same doctor. Care was taken not to introduce an excessive element of suggestion. Patients were told that the three months' trial was to determine which treatment suited them best and nothing was said about the promise of results.

RESULTS.

Results were recorded as "improved", "unchanged", or "worse". Cases were marked "? improved" when either the patient or the doctor decided there was an improvement and the other did not agree. The assessment of improvement in acne is not easy because of the spontaneous fluctuations in severity which are a usual part of the disease; cases were therefore marked as improved only if the degree of improvement was deemed to be greater than the spontaneous improvements which that patient had previously shown. Results are shown in Table I.

Of those improved, three were greatly improved and all of these were on tolbutamide. In the nine who became worse, seven were so because of relapses

TABLE I.—*Results of Treatment.*

	Improved.	? Improved.	Total improved.	Unchanged.	Worse.	Total unimproved.
Tolbutamide . . .	9	4	13	15	2	17
SMP	9	7	16	11	1	12
Lactose	5	2	7	17	6	23

after improvement on previous treatment and not a worsening of their original state. Six patients were unchanged by any treatment and two patients improved with all three treatments. It seems fair to group together the improved and doubtfully improved in contrast to those who were clearly not improved. When this is done tolbutamide and SMP show an advantage over lactose.

Improvement with tolbutamide did not go hand in hand with improvement on SMP. For example, among the 16 showing improvement or doubtful improvement with SMP, tolbutamide gave 6 improved and 10 not improved. The beneficial effect of SMP is probably due to an antibacterial action, comparable with that of antibiotics, on acne.

During the trial five patients developed a widespread erythematous rash and facial oedema. The pattern was the same in all and was thought to be due to a drug eruption. It was subsequently found that all of these occurred during the period of SMP therapy. There were no symptoms suggesting hypoglycaemia.

DISCUSSION.

These results clearly do not show the uniform improvement reported by Cohen and Cohen. To some extent this may be due to the selection of cases in their series. Their twenty-six cases included other pustular dermatoses such as rosacea and sycosis, but nineteen were of acne. Most of the latter were severe and pustular but from the present series it does not appear that severe or pustular cases respond better to tolbutamide. In the series of Cohen and Cohen, treatment was often continued for two to four months and it may be that improvement would have been obtained more often in the present cases if treatment had been prolonged.

The mode of action of tolbutamide in acne is uncertain. The pharmacology of tolbutamide has been reviewed by Slater (1959). The weight of evidence at present indicates that its action in man is probably on the liver, perhaps involving the inhibition of glycogenolytic enzymes. Its effect in normal subjects is to lower blood glucose by about 40%, though probably to a less degree in the doses used in the present study. So far as the skin is concerned, this effect of lowering the concentration of sugar brought to the organ is the only effect which we know tolbutamide to exert. Tolbutamide has been shown to have some influence in diminishing thyroid activity (Brown and

Solomon, 1956), but it does not appear to influence the pituitary-adrenal group of hormones (Renold *et al.*, 1956; Fajans *et al.*, 1956). No influence on the androgen-oestrogen balance can be postulated.

Cohen and Cohen recall Urbach's concept of "skin diabetes" and suggest that tolbutamide may act in acne by influencing the peripheral metabolism of sugar. Repeated investigations, however, have failed to reveal any peripheral action of tolbutamide and this mechanism therefore seems improbable, though it cannot be completely ruled out (Slater, 1959).

Finally, an antibacterial action of tolbutamide cannot be demonstrated and this conforms with the present results in which response to tolbutamide is independent of response to SMP—the effect of the latter being presumably antibacterial.

The concept that cutaneous pyogenic infection is affected by blood sugar levels is of course well known as far as concerns the raised blood sugar in diabetics. There is also some evidence that even in normal subjects the administration of insulin after the main meal may promote healing of skin sepsis (Miller, 1940). It is, however, not certain that this would satisfactorily explain the present findings since improvement was observed in some mild cases with no pustules and where the importance of infection is doubtful. The role of infection in producing the non-suppurative lesions of acne is not clear.

The action of tolbutamide here recorded is of some interest but does not necessarily constitute a therapeutic indication. In this series, dosage was not related to dietary intake and perhaps because of this the improvement observed was inconstant and unpredictable. Considerable further study is evidently required before we can decide whether tolbutamide has a place in the regular treatment of acne.

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THE BACTERIOLOGY OF ACNE VULGARIS IN RELATION TO ITS TREATMENT WITH ANTIBIOTICS

M. A. SMITH

Department of Dermatology,

AND

PAMELA M. WATERWORTH

Department of Bacteriology,

St. Bartholomew's Hospital, London.

BACTERIOLOGICAL studies of acne vulgaris have led to conflicting reports. Some claim the isolation of various types of micrococci or corynebacteria from the lesions, but in others the latter have been reported as bacteriologically sterile. As the particular type of lesion tested and the methods of collection and culture have not always been specified, the opposing results cannot easily be reconciled.

The aims of this investigation were to define the bacterial contents of acne lesions microscopically and culturally, to study the antibiotic sensitivities of the bacteria isolated before and after antibiotic treatment and in relation to the clinical condition of the patients, and to assess the significance of bacteria in the pathogenesis of acne vulgaris.

INVESTIGATION.

Thirty-nine out patients with acne vulgaris were investigated; their ages ranged from 15-32 years. The sex ratio was 23 males to 16 females and each had suffered from acne for a period varying from a few months to 16 years, most being in the 1-5 year category.

After cleaning the skin with ether, the specimens were collected with a sterile comedo extractor and the plug of material so obtained was crushed between two sterile slides which were then fixed together with adhesive tape and sent to the laboratory. After the tape had been removed, the slides were pressed firmly together and then pulled apart with a sliding movement, leaving a film of material on each; one was de-fatted with ether and stained by Gram's method: the other was made into a suspension with a drop of sterile saline and cultures were made from this on blood agar aerobically and on blood agar and glucose agar anaerobically in MacIntosh and Fildes' jars with 5% CO₂. The former were incubated at 37° C. for 2 days and the latter for 4 days or longer.

Pure cultures of *Corynebacterium acnes* were maintained in Robertson's meat broth and such cultures were used as the inoculum in sensitivity tests. Multiple sensitivity tests were performed by an agar diffusion method; cups were cut in blood agar plates with a sterile cork borer of 9 mm. diameter, inoculated with a 1 mm. loopful of 3 day old meat broth culture and the inoculum evenly distributed over the whole plate with a sterile glass spreader. The cups were then filled with penicillin (10 units/ml.), erythromycin (25 µg./ml.), tetracycline (50 µg./ml.), streptomycin, chloramphenicol and sulphafurazole (250 µg./ml.) and the cultures incubated anaerobically in MacIntosh

and Fildes' jars with CO_2 at 37°C . for 4 days. It was found that only three cups could be put in each plate: if there were more the slow growth of the organism and its high degree of sensitivity caused such large zones of inhibition that sterile cultures frequently resulted. Sensitivity tests to penicillin and tetracycline were also made by a dilution method: 5% blood agar plates were prepared containing a series of 1, 2 dilutions of the antibiotics. These were inoculated with up to 12 strains of *C. acnes* and incubated anaerobically in MacIntosh and Fildes' jars with CO_2 at 37°C . for 4 days.

RESULTS.

Sixty-seven specimens were obtained from the following types of lesion: 23 comedones, 33 papules, 7 pustules and 4 cysts, the term pustule being used for those lesions with a yellow head and cyst for those which were soft and fluctuant. The bulk of the specimens consisted of sebaceous material and bacteria; pus was seen in only 15 of the Gram films. The bacteriological findings were very similar from the different types of lesion.

Stained films.—Gram-positive rods having the morphological appearance of acne bacilli were seen in films from 59 out of 67 specimens. They were sometimes accompanied by smaller numbers of Gram-positive cocci, and in three specimens by yeast-like organisms.

Aerobic cultures.—A growth of *Staphylococcus albus* was obtained from 44 specimens and of coliform bacilli from 1, the remainder being sterile. In no case was *Staphylococcus pyogenes* found, nor did any aerobic culture yield a growth of Gram-positive rods.

Anaerobic cultures.—A growth, usually profuse, of Gram-positive rods identical with those seen in films, having the colonial characters of *C. acnes*, was obtained from 57 of the 59 specimens in which the organism was seen in the film. These 57 cultures came from 34 patients, sometimes from more than one lesion on a single patient; 11 of them were isolated from a second specimen taken a few weeks after the first and 7 from a third specimen, usually after systemic antibiotic treatment. Five of the ten specimens from which acne bacilli were not grown came from four of the thirty-four patients already mentioned, from whom a culture had been obtained at another time, one patient giving two negative cultures, and the other five negative cultures were from five patients tested on the one occasion only. (Table I.)

Sensitivity of C. acnes to antibiotics.—Agar diffusion sensitivity tests were performed on 24 strains of acne bacilli which all proved, by this method, to be

TABLE I.—Results of Bacteriological Cultures.

No. of specimens	Gram film	Culture	
		Aerobic	Anaerobic
67	Gram +ve bacilli	44	57
	Gram +ve cocci	1	
	Yeasts		
	Pus		

highly sensitive to penicillin, tetracycline, erythromycin, chloramphenicol and sulphafurazole and considerably less sensitive to streptomycin. Thirty-two strains were tested to penicillin G and tetracycline by the dilution method and the results are shown in Table II.

TABLE II.—*Sensitivity of C. acnes to Antibiotics.*

No. of strains inhibited by	Dilutions of antibiotics, $\mu\text{g./ml.}$						
	2	1	0.5	0.25	0.12	0.06	0.03
Penicillin	—	—	—	—	5	16	11
Tetracycline	1	8	23	—	—	—	—

Garrod (1960*a* and *b*) showed that there are wide differences in the sensitivity of some species of bacteria to different penicillins. In view of this, eight strains of *C. acnes* were tested against penicillins G, V and phenethicillin ("Broxil") and it was found that G had twice the activity of V and four times that of broxil. On the other hand, the blood levels attained by G when given by mouth are considerably lower than those obtained by V and broxil and this might neutralize the effect of the differences in sensitivity. It would be expected that organisms requiring the higher levels of penicillin and tetracycline to inhibit growth would show smaller zones of inhibition by the agar diffusion method but this was not so. This is due to the slow rate of growth of acne bacilli which permits prolonged diffusion of the antibiotic before growth occurs, and it serves as a reminder of the unsuitability of this method for testing slow-growing organisms.

Effects of antibiotic treatment.—Twenty-seven patients received systemic chemotherapy (Table III), the local treatment remaining unchanged.

TABLE III.—*Effects of Antibiotic Treatment.*

	Dose	No. of patients	
		improved	unchanged
Tetracycline	250–500 mg. daily	11	3
	4–12 weeks		
Penicillin V	125–250 mg. thrice daily	4	3
	4–8 weeks		
Sulphamethoxypyridazine	0.5–1 g. daily	3	3
	4–14 weeks		

Some of the patients remained well after stopping the chemotherapy, others relapsed and responded to a further course. The bacteriology of specimens taken during and after treatment showed no significant change from those taken before, and the sensitivity of the bacilli was unaltered except in one instance: eleven strains from second or third specimens isolated on the last day of the course of antibiotic treatment were tested along with the original strain;

the sensitivity of ten was unchanged, and in one patient who had taken penicillin V for two months, the minimum inhibitory concentration of the second isolation was $0.12 \mu\text{g./ml.}$, compared with $0.06 \mu\text{g./ml.}$ of the original. Eight of the eleven strains were isolated following tetracycline 250–500 mg. daily for 4–12 weeks, and the other three had received penicillin.

In view of these findings an attempt was made to see if any antibiotic could be detected in the contents of the lesions. Very thin agar plates were prepared (i) pre-seeded with a spore suspension of *Bacillus cereus* and (ii) surface-seeded by flooding with a broth culture of *Sarcina lutea*. Material obtained from acne lesions with a sterile comedo extractor was placed directly on the plates, allowed to diffuse at 4°C. for 3 hours and incubated overnight at 20°C. and 37°C.

Specimens were obtained from 8 patients taking from 250 mg.–1 g. of tetracycline daily, from 3 taking 750 mg. of penicillin V daily and from 6 receiving no antibiotics; those specimens from the patients taking tetracycline were placed on *B. cereus* plates, those from patients taking penicillin on *S. lutea* plates, and those from the control not taking antibiotics on both. The material varied from hard dry comedones to the contents of papules and small cysts.

RESULTS.

A small zone of inhibition of bacterial growth varying from 1–3 mm. in radius surrounded almost every specimen in which the material was soft and moist, but not those in which it was hard and dry, irrespective of whether the patient was receiving antibiotics or not. There seemed to be two possible explanations for this: *C. acnes* has been shown by Douglas and Gunter (1946) and Lewis (personal communication) to produce propionic acid, a substance which is inhibitory to some species of bacteria and which might produce this inhibition. However, when a 2 mm. loopful of a 1% aqueous solution of propionic acid was placed on the test plates there was only slight inhibition of *B. cereus*. On the other hand when a loopful of sebum extracted with carbon tetrachloride from the uninvolved skin of a patient with acne was placed on both types of plate, zones of inhibition were produced on both, although the patient was not receiving any antibiotics. The inhibitory effect, therefore, seems to lie in some property of the sebum. We obtained no evidence, therefore, that either tetracycline or penicillin in the doses given penetrated into acne lesions. The absence of any zone of inhibition round the hard comedones is probably due to the failure of these to diffuse into the agar.

Propionic acid.—Whether *C. acnes* is pathogenic under any circumstances remains to be proved. The production of propionic acid might cause inflammation or necrosis, with the possibility of an increased susceptibility in people with acne.

We gave intracutaneous injections of 0.1 ml. of 0.01% aqueous solution of sodium propionate into the backs of three patients with acne, with injections of normal saline as controls; there was no difference in reaction between the test sites and the

controls. Similar results were obtained with 0.1% and 1% solutions of propionate and with 0.01 ml. of 1% propionate injected into a follicle, each category being tested on three patients with acne and three normal people.

This absence of reaction to propionate was in contrast to some other experiments in which a small comedo was pushed into the shaft of a No. 1 hypodermic needle and then injected into the donor by means of a small blast of air from a syringe. In some cases this produced an inflammatory papule during the next few days, which broke through the skin surface and formed a crust in a few cases. The technique was considered unsatisfactory because one could not tell whether, in fact, the material had been deposited in the skin from the needle, it being assumed that this was so when a papule resulted. In fact many injections were negative, only a minority giving rise to inflammation. In view of the unreliability of the technique it was not considered worth while submitting the patients to biopsy to try to demonstrate the material in the skin. Some patients who subsequently developed inflammatory papules were taking systemic antibiotics at the time of the injection.

Punch biopsies.—Biopsies with a 5 mm. circular metal punch were done under local anaesthesia. Papules were removed from the backs of three patients with acne vulgaris and the sections stained with haematoxylin and eosin and with Gram's stain. Aggregations of *C. acnes* were seen in the centre of some of the follicles in each of the Gram films and in one section there was a small clump of the bacilli lying in the dermis. An intense inflammatory reaction with polymorphonuclear leucocytes and round cells was present both in the perifollicular and the perivascular zones. Some of the sebaceous gland tissue had undergone dedifferentiation and the rest appeared normal.

Comedo without acne.—A woman of 25 years had a few comedones on her nose, never having suffered from typical acne, although there are those who define acne vulgaris as the presence of comedones on the skin (Lipman Cohen, 1960). One of these comedones was tested: the Gram film showed many Gram-positive bacilli, the aerobic culture grew *Staph. albus* and the anaerobic *C. acnes*. Films of comedones from three other similar people all showed the presence of Gram-positive bacilli.

DISCUSSION.

C. acnes was first described in acne lesions in 1893 by Unna (1896). Hodara (Ketron and Burky, 1925) obtained a slight growth of *C. acnes* on agar plates and Sabouraud (1897) first produced satisfactory cultures of the organism. Lovejoy and Hastings (1911) commented that *C. acnes* was present in greater numbers in the early lesions of acne than in the large pustules.

Recent workers have isolated staphylococci of one type or another more commonly than *C. acnes* from acne lesions. Andrews *et al.* (1951) reported that

pustular lesions yielded only staphylococci and Becker (1953) obtained 8 cultures of mixed diphtheroids from 67 specimens from acne lesions, the remainder yielding staphylococci (47) or no growth (10). It was not stated whether anaerobic cultures were made. Cronk *et al.* (1956) found mainly staphylococci in beef heart broth cultures from the acne lesions of 72 patients, with an occasional associated bacterium and Cronk, Naumann and Garrison (1956) obtained *Staph. pyogenes* from the lesions of each of 51 patients with acne before treatment with systemic antibiotics and from most of them after treatment. The staphylococci of some of the patients who improved were resistant to the particular antibiotic. Many acne lesions have been reported as being sterile (Mitchell-Heggs 1959 ; Ingram 1960).

Evans *et al.* (1950) identified the bacteria in scrapings of normal human skin from the deltoid and scapular regions and estimated that the anaerobes outnumbered the aerobes by at least ten to one, the anaerobes being largely *C. acnes*. They also found that washing the skin made little difference to their results and concluded that the bacteria came largely from the sebaceous glands or their ducts. Goldschmidt (1925) found that the bacterial flora was similar in acne comedones and pustules and on normal skin and did not isolate *Staph. pyogenes* from any of the specimens.

Our findings from acne lesions show a bacterial flora very similar to that obtained by Evans *et al.* from normal skin, and do not support the contention that many acne lesions are sterile, although the bacteria which have been isolated have not been shown to be pathogenic. Nor did we find any significant differences in the bacteria isolated from the different types of lesion, the pustules and cysts included. This does not support the view that *C. acnes* is absent from the more mature lesions or that secondary infection with *Staph. pyogenes* is a common event.

One particular interest of these results lies in relation to the treatment of patients with acne vulgaris with systemic chemotherapy. The sulphonamides (Hurst, 1954 ; Schoch and McCuistion, 1955), penicillin (Becker, 1953) and the broad-spectrum antibiotics (Cronk, Naumann and Garrison, 1956 ; Robinson, 1954 ; Stritzler and Frank, 1960 ; Sulzberger *et al.*, 1960) have all been reported as beneficial in acne, the greatest unanimity being in respect of the broad-spectrum group of antibiotics. Although not exclusively beneficial in the cystic type of acne (Baer and Witten, 1960), the antibiotics find their greatest favour in controlling this very type of acne which is most commonly reported as sterile. In addition, the antibiotics are quite often given in doses which would be considered inadequate to control infection by many people. We found little alteration in the bacterial flora from acne lesions after courses of chemotherapy of up to three months and no increased resistance to the antibiotic prescribed. The relatively high sensitivity of these strains of *C. acnes* to penicillin is interesting. Craddock (1942) used culture filtrates of penicillin to make a

selective medium to isolate acne bacilli from staphylococci and found a forty-fold difference in the sensitivity of the two-organisms, but our strains of *C. acnes* were only from one and a half to six times as resistant as the standard staphylococcus. These findings would suggest that penicillin should be the most effective of the antibiotics, yet there are no clinical reports to support this contention.

In our attempts to demonstrate whether there was any significant percolation of antibiotic into the acne lesions by means of the inhibition of the appropriate bacteria on an agar plate, we found zones of inhibition were produced by material from both treated and untreated acne cases and also by sebum extracted from the surface of normal human skin with carbon tetrachloride. It was not possible to distinguish between this non-specific inhibitory effect and any possible inhibition by tetracycline or penicillin.

These problems raise the question of the mode of action of the antibiotics in acne patients and whether it could be by an effect other than on the bacteria in the lesions themselves. Loveman and Noojin (1957) obtained qualitative and quantitative differences in the lower bowel flora of acne patients given systemic antibiotics with improvement of their acne, but Baer and Brodie (1960) gave oral neomycin and nystatin to acne patients without benefit, so that alteration of the bowel flora by an antibiotic without systemic absorption does not appear to be effective. Speculations concerning possible alternative effects of antibiotics whereby they benefit patients with acne vulgaris are beyond the scope of this paper.

SUMMARY.

Sixty-seven specimens of material from acne lesions were obtained from 39 patients with acne vulgaris and *C. acnes* was seen in the Gram films of 59 and cultured anaerobically from 57. The microscopic and cultural characteristics and the antibiotic sensitivities of the bacilli are reported before and after treatment with systemic antibiotics. *Staph. albus* was cultured from 44 of the 67 specimens aerobically, but no *Staph. pyogenes* was isolated. It was not possible to demonstrate any antibiotic in the lesions. Intrafollicular and intracutaneous injections of a solution of sodium propionate did not evoke an inflammatory response.

The advice of Dr. R. M. B. MacKenna and Professor L. P. Garrod on the clinical and bacteriological aspects respectively of this work is gratefully acknowledged.

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LETTER FROM MIAMI.

THIS letter is sent from southern Florida where "the toe of Florida dips into the sea in a fascinating clutter of coastal islands, swampy, amphibious jungle and tropical sunshine". It is sent from Miami, the southernmost large city of the U.S. mainland, a world-famous resort, an important city and an international transportation centre for rail and air. Yet fifty years ago it was little more than a village. The most remarkable thing of all about this remarkable place has been its growth. In the last forty years it has increased twentyfold and it is still increasing as fast.

There is Miami Beach where more than a million people come every year and outnumber the permanent population there by thirty to one. This is a place of flamboyant luxury and extravagance, devoted entirely to leisure and pleasure. Hotels stand like small cities, shops are opulent, houses are luxurious. And there is Miami City, where people from everywhere pour in to try their luck, to find a job and stay in the Sunshine State. Nearly everyone is a stranger from another part of the continent. A Southern accent is heard no more often here than any other. This is a place of frenzied competition where shops stay open fourteen hours a day and advertising is frantic. This is the home of drifters, of those with no roots; but also of the adventurous and enterprising. And so this is no place in which to judge the American way of life; it is just a melting pot of America.

Floridians will say that the climate is almost always perfect, and this is probably as true here as anywhere. This state has more sunshine than almost anywhere else and this is one of the main attractions of Miami. Although the heat and humidity become oppressive in the summer months, the rest of the year is sunny and very pleasant. A by-product of Florida's climate is the superb, dramatic skies. At night sometimes one can look up and see immense white clouds, quite still against a black sky. In the summer comes the rainy season. The rainfall occurs suddenly, sometimes in heavy, violent storms, which seldom last more than a few hours. Otherwise it is sunshine all the way. In fact, in one town, St. Petersburg, a newspaper gives away its edition free on any day the sun doesn't shine. It gives away few papers. The rainy season may at times herald the arrival of hurricanes. In 1960 Miami experienced its first real hurricane in ten years. As we heard that the centre of the storm was approaching us, with winds at 150 m.p.h., feelings ranged from fear to excitement and curiosity. For half of Miami's population had not experienced the last one and many, like us, had never been through one at all. Radio, television and newspapers suddenly became extremely efficient, issuing warnings minute by minute, telling us to store water and tins of food, and to shutter the windows. People living near the sea, in low-lying areas, were evacuated to storm shelters. We all knew exactly when to expect the impact and to shut ourselves indoors. It came during the night, not the centre of the storm, but the winds were 100 m.p.h. and it sounded and looked as though the earth had gone out of control. The electricity went, the telephone went, in some places the water went. The storm levelled eighty per cent of a place called Tavernier. We drove round after the all clear was sounded and saw how the wind had uprooted trees, shredded shrubs and shattered windows. The roads were flooded from the torrential rains that accompanied the winds.

When one's plane approaches Miami, one faces a spectacle of thousands of widely dispersed white houses bathed in sunshine and surrounded by the beautiful blue of the sky and the sea. The houses are made of concrete blocks and stucco, placed on concrete slab foundations without basements. This is because the water table is three to four feet below ground level and the ground is mainly oolite limestone, which is the source of cement. Incidentally, one of the few recent major industries of Miami is the production of cement and in spite of the fact that these cement plants

have been functioning for some two to three years, apparently no cases of cement dermatitis have been seen at the hospital from the locally produced cement. The imported varieties, however, have not uncommonly given rise to this condition.

Whereas in England the method of heating a house is an essential point, here the most important requirement is air conditioning. It was only when this was introduced that Miami was able to begin developing as it has done. From May to October the heat is sweltering and oppressive, and without air conditioning, life is very uncomfortable. Houses here differ also in other ways from those in England. They are mostly on one level with large uncluttered rooms. A swimming pool is not unusual and nearly all houses built here have a "Florida" room, a long tiled glass-walled sun lounge. Furniture tends to be lightweight. The front door usually leads straight into the drawing room, for here there are no overcoats to be hung up and no dust or mud to cope with. In fact, all in all, although these houses seem luxurious, they are simply meeting in the most practical way the requirements of the climate for which they are built.

One's initial surprise at finding a public road transportation system very inadequate compared with English cities soon wears off and one becomes car-bound on the well-planned wide roads arranged in the grid system and supported by spacious car parks. However, one can never get used to or take for granted the natural beauty of the place, with its tropical and subtropical flowering trees, indigenous to the Caribbean and West Indies, e.g. poincianas, jacarandas, African tulip tree and a great variety of cassias, rich in yellow. There is a great variety of palm trees assuming attractive shapes, from the creeping palmetto to the stately Royal palm. Tropical and citrus fruit are commonplace in the back or front gardens of private homes and one sees bananas, oranges, tangerines, limes, grapefruits and a British import from India—the mango. The Central American avocado is cheap and widely eaten throughout the southern United States. Other delicacies are melons, Barbados cherries (which incidentally are a source of vitamin C second only to rose hips), guayabas and coconuts. Mahogany, ficus, logwood (the source of haematoxylin) and the Sheffilaria are some of the exotic trees commonly seen. The fauna of Miami is, on the whole, comparable to that of England, except for a few colourful birds, such as flamingos, cardinals and black skimmers.

The University of Miami started in 1925, and originally occupied a bankrupt hotel building, but now the 260-acre main campus has many striking buildings. These include a theatre and an art gallery. The north campus houses radio, television and film departments with studios and laboratories, and a marine laboratory. The south campus is a tract of 2048 acres that was once a naval air station. It is now a research centre where there is an experimental farm and tropical food research laboratories. Housing research is carried out here: and on this campus the university has established a colony of rodent animals for use in medical and scientific research.

The school of medicine, like the city of Miami, has developed at a most amazing rate, since its establishment in 1951, into a centre of high standing, with research facilities and achievements equal to or better than many of the well known and long established schools in the United States. Perhaps one should avoid selecting any well known personalities here, but it is difficult to resist the temptation of mentioning Arthur C. Allen, the pathologist whose second home is dermatology, and Robert Nelson, whose name has become a household word since he discovered the T.P.I. test.

The teaching hospital for the University of Miami School of Medicine is the Jackson Memorial Hospital which has 1400 beds (Fig. 1). The hospital provides facilities for private, part-pay and staff (charity) patients. Every patient goes through the social service, which determines the dues on the basis of economic status. The question of finance is, of course, of great importance when deciding on laboratory investigations and treatment for out-patients and when admission to hospital becomes necessary. Obviously, every single day's extra stay may mean economic difficulty to the patient.

This problem, when first encountered, has a striking impact on a doctor accustomed to the National Health Service in Britain.

The Department of Dermatology occupies an unusually important position in the hospital and commands a great deal of respect. It has a large and active research programme, a formal teaching programme for medical students, a residents' (registrars') training system and a good clinical side. Professor Harvey Blank (Fig. 2), who is Chairman of the Department, has been responsible for its development and growth. Dermatological research takes place on the second floor of the new seven-floor Research Building. Although special clinical problems are investigated as and when they arise, the trend is towards basic research and the development of new investigative techniques in physiology, electron microscopy, mycology, tissue culture, etc. Dr. Blank does not "direct" the research from his office. With his background of training in research work, he is much happier in the laboratory and some-

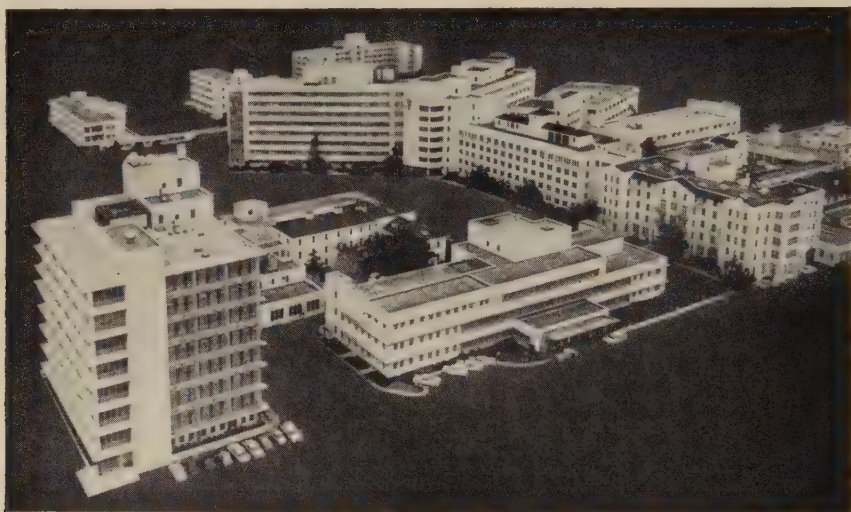


FIG. 1.—Jackson Memorial Hospital. Research Building in the foreground on the left.

how manages to find time for half a dozen projects concurrently, his main interest at the moment being experiments in sweating carried out with a "gadget" consisting of two elements which measure electrically minute differences in humidity. His book *Viral and Rickettsial Diseases of the Skin* is well known, his work and interest in fungi and griseofulvin continue and he is writing another book on antifungal and anti-moniil therapy.

Professor A. Gideon Matoltsy is immediately in charge of the Research Laboratories and is an authority on tissue culture techniques and electron microscopy. He left the Rockefeller Institute some eighteen months ago to join the Department here. His recent work on keratinization is well known and his photo-electron micrographs of the life cycle of keratohyalin granules are fascinating and show clearly some of the final stages of the keratinization process. The epithelial barrier to skin penetration, its functions and location are accepted concepts in this Department and they have been investigated by Dr. Blank and Dr. Samuel Monash who has also studied the effect of x-rays on fungi and is now carrying out experiments on sun sensitivity and sun screening agents. The position of Instructor in the Department (which is perhaps equivalent to our grade of Lecturer or Senior Lecturer) is held by Dr. E. W.

Rosenberg who has been engaged in tissue culture work for some time and whose efforts to keep alive human skin as an organ show great promise. In this friendly but scientific atmosphere, it is nice to hear the English accent of Mr. Taplin from Southampton who is the Senior Laboratory Assistant. He is co-author with Dr. Blank of a recent electron microscopic study on fungi and is an accomplished electron microscopist.

The amount of modern apparatus in the Laboratory is most impressive. There is an electron microscope and recently an amino acid analyzer has been installed. Dr. Robert Crounse is particularly interested in this machine which cost about £4000 and which is used for quantitative determination of the various amino acids in proteins and in physiological fluids. He feels that this impressive instrument is

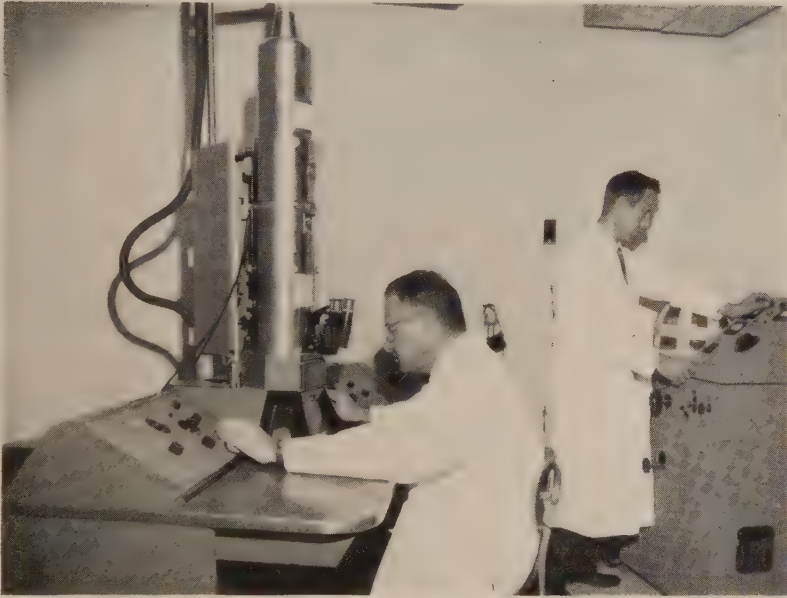


FIG. 2.—Dr. Blank operating the electron microscope.

not as automatic as the manufacturers imply, but admits that it cuts down the time of a single protein analysis from about a week to one day. He also has recently carried out a study of the absorption of griseofulvin in humans. Dr. Frank Roth is in charge of the Mycology Section and also holds the position of Associate Professor of Microbiology at the University. He is one of the foremost authorities on fungus work in the country, has written numerous papers on the subject and was very active in the griseofulvin studies conducted here last year.

The teaching of dermatology to undergraduates differs in a number of respects from the system practised in London. The students spend only four years at Medical School but must possess a degree in Arts or Science before entering. They are, therefore, on the whole, older, perhaps more mature, and many of them are married. They are given a few formal lectures on skin diseases in their third and fourth year. They spend several weeks attending the clinic where they take histories, examine patients and are supervised by the instructor. There is an examination in dermatology based on a list of reading assignments in the fourth year. The reading material consists of selected chapters in a number of textbooks and recent papers

covering more important subjects. During the summer holidays, students are encouraged to work in research laboratories and are paid by government funds to do so. This provides a kind of nucleus of people trained in research techniques by the time they reach their residency stage.

The residents' (registrars') training system in dermatology consists of a three years' course in an approved department. The formal teaching programme must meet the basic science requirements of the American Board of Dermatology. Upon completion of the third year of training, the candidate is qualified to take the examination of the American Board of Dermatology, leading to certification as a specialist in this field. At this point it is interesting to note a recent ruling that the chief of training in a three-year approved institution may assign one of his trainees to spend one year at St. John's Hospital in London. This is the only institution outside the U.S.A. with this distinction. All the residents work in the out-patient clinics under the supervision of the full-time faculty members and the attending staff who are local experienced practising dermatologists. Controlled clinical studies are almost routine, a mycological laboratory is attached to the clinic and is used by the residents, radiotherapy is carried out in the department and a small library of dermatological textbooks and journals is available. Each resident spends six months doing histopathology under Dr. Allen's direction. The residents are encouraged to do research and several of the younger men are actively engaged in laboratory research for as much as a year. This is carried on simultaneously with their clinical training and in both types of work they are supervised mainly by the head of the department. Dr. Blank, out of departmental funds, underwrites the expenses for the residents (except the first year men) to attend the annual meeting of the American Academy of Dermatology in Chicago. This amounts to approximately £100 per person and is of no mean benefit to the people in training.

As can be expected, the incidence of skin disease in Miami is influenced by the subtropical climate, and the flora. Prickly heat is generally easily recognized, but it does at times present difficulties in differential diagnosis. Light sensitivity, keratoses and basal cell epithelioma are extremely common. Chilblains are unheard of, but discoid and systemic lupus erythematosus are probably no commoner than they are in England, in spite of the great amount of sunshine. Industrial dermatitis is much less commonly seen here than in England, but this deficit is more than made up by dermatitis caused by poison ivy, cashew nuts, mangos etc. Dermatitis caused by sensitivity to citrus fruit, particularly limes, associated with the characteristic pigmentation, is reproducible and was described in detail by Dr. Wiley Sams, Clinical Professor of Dermatology to the Hospital. Venereal disease is relatively common, particularly amongst the coloured population, and during the past three months I have seen here syphilis in all three stages, chancroid, granuloma inguinale and lymphogranuloma venereum. Creeping eruption due to *Ancylostoma brasiliense* is fairly common, easily diagnosed as a rule, but it may at times hide behind a pyoderma or simulate a patch of lichen simplex. Superficial fungus infections and moniliasis are extremely common. Erythrasma, occurring in large scale patches, mainly in middle-aged negro women, is not rare and is characterized by coral pink fluorescence under Wood's light. Rarities which make life interesting also occur here. A recent case of tinea nigra of the palm and another of chromoblastomycosis on the legs were such worthwhile curiosities.

EMERY SARKANY

BOOK REVIEWS.

HYPNOSIS.*

THE author of this book is a dermatologist who has practised hypnotic treatment on his patients for the past ten years. One might have hoped, therefore, for some firm guidance on the type of dermatological patient most responsive to this method and the results which can be achieved. Unfortunately, on these two points the author is strangely vague.

A brief historical introduction precedes a detailed discussion of the requirements of physician and patient for success to be attained. Dr. Scott appears to regard a training in psychiatry and an acceptance of the principles of dynamic psychiatry as essential for the would-be practitioner of hypnosis. Few dermatologists are so equipped and neither were the successful hypnotists, Mesmer, Braid, Esdaile and Charcot, to name but a few of those mentioned by Dr. Scott in his historical note. A detailed description of the techniques of hypnotic induction follows. A number of photographs of patients undergoing this treatment adds nothing of value to the text which contains much sound and practical advice. Much of this tends to be somewhat repetitive but it raises a number of points of considerable interest to those practising hypnotherapy. Many of the author's comments are shrewd, indicating considerable experience in this technique.

Dermatologists who wish to read of the results of Dr. Scott's methods will turn to the chapter on their application in dermatology. Unfortunately, although the author gives fairly detailed accounts of the work of other therapists, he is silent about his own results. He lists a number of conditions which should respond favourably but gives no figures or follow-up studies. This is a pity as Dr. Scott gives the impression of being a careful and considerate physician with considerable experience in hypnotic technique.

This is a curiously uneven book. To say the least, it seems odd that a dermatologist should refer to Dr. Mason's celebrated case as a case of congenital ichthyosis despite the fact that in the reference the paper is entitled "A case of congenital ichthyosiform erythrodermia of broc (*sic*) treated by hypnosis". A number of misprints mars the text of which this is but one. It would have been helpful if reference numbers to the bibliography had appeared in the text so that one could check the source of some of Dr. Scott's more questionable assertions. Some of the references appear more than once depending on the number of authors responsible for the paper being quoted. Dr. Scott's classification of dermatoses with important psychic components makes strange reading to a psychiatrist who, along with a good many dermatologists is concerned with simplifying the nomenclature of their specialities. The term "bromhidrosiphobia" means, your reviewer assumes, that the patient believes that he smells unpleasantly, a condition more akin to a delusional belief rather than a true phobia. To describe dermatitis factitia under the heading of malingering shows a remarkable misunderstanding of the nature of this hysterical disorder.

For those who wish to learn the technique of hypnosis no text can fully replace practical instruction. Existing works can supplement such instruction and your reviewer does not feel that many dermatologists will find Dr. Scott's book of great value when it comes to applying hypnotic methods in the treatment of their own patients. This does not mean that such methods are to be despised as in selected cases they can achieve dramatic results. Let us hope that Dr. Scott will give us another book which will indicate clearly, from his own experience, just how satisfactory these results can be.

F. A. W.

* *Hypnosis in Skin and Allergic Disease*. M. J. SCOTT, (1960). Springfield, Ill.: Charles C. Thomas, Oxford: Blackwell Scientific Publications. Pp. 161. Price 52s.

CURRENT LITERATURE.

RESULTS AFTER CORTICOSTEROID THERAPY IN PEMPHIGUS VULGARIS. W. WHITTELS.
(1959) *Derm. Wschr.*, **141**, 402.

Twenty-five patients, 11 of which were suffering from p. vulgaris, 7 from p. erythematousus or Senear-Usher syndrome, 2 from p. vegetans, 1 from p. foliaceus and 4 from mucous membrane pemphigus were treated at the Vienna University Clinic over a period of 10 years. The mortality was 4% (patients treated with steroids) as opposed to almost 69% (in the pre-steroid area). One patient only died and out of 24 surviving patients only 4 need now small maintenance doses. Treatment was begun with large doses for a few days (starting with a total daily dose of cortisone of 300, 500 or 600 mg., later the equivalent in prednisone or prednisolone was given) followed by a quick reduction of the total dose by 5-10 mg. of prednisone daily. Simultaneous penicillin or wide spectrum antibiotics were exhibited. Boosting doses of A.C.T.H. were ordered at the end of the course and otherwise A.C.T.H. was only employed when there was no response to cortisone (usually 40-60 units of Depot A.C.T.H. daily occasionally up to 150 units was given). There was no serious or fatal complication. P. vulgaris and foliaceus responded best, whilst p. erythematousus and mucous membrane pemphigus were very resistant. A combination with other medication (for instance, aureomycin and chloroquine as recommended by Gaté) did not improve the results. The clinical picture seemed to change at times during treatment, for instance, from a typical p. vulgaris into classical Senear Usher syndrome or p. foliaceus. In spite of their purely morbidity-static effects, steroids are considered the treatment of choice.

J. M.

THE CLINICAL PHENOMENA OF MALIGNANT MELANOMA AND ITS HISTOLOGY. W. KNOTH. (1960) *Derm. Wschr.*, **141**, 411.

Suggestive signs of a malignant melanoma, for instance, the formation of pearls and blisters as well as a tendency to haemorrhage, are stressed as having clinical importance and the histological features as well as pathological mechanism are discussed. Residual pigmentation after radiotherapy is of no importance. Biopsies or scraping for cytodiagnostic purposes are again deprecated.

J. M.

DO TAR AND PITCH CHANGES OF THE SKIN ENCOURAGE THE GROWTH OF FUNGI?
J. SCHÄFER. (1960) *Derm. Wschr.*, **141**, 416.

The thickened horny layer in these patients does not provide favourable conditions for fungi. Pitch and tar contains fungicidal substances, e.g., sulphur, and the horny layer has a very acid reaction. In the macerated skin of miners, however, (through frequent warm baths) the pH values are higher and fungi will easily enter the skin and multiply.

J. M.

BUTAZOLIDINE THERAPY OF ACUTE SUPERFICIAL THROMBOPHLEBITIS. V. ELLERBROEK. (1960) *Derm. Wschr.*, **141**, 464.

The author has been using this method for 5 years on a large number of ambulant patients. Rest in bed is unnecessary and patients become symptomless within a few hours. Up to 3 intramuscular injections were given intragluteally and were repeated earliest at 48 hour intervals. Most patients needed, however, only one injection. Oral or rectal medication was not as effective and there were no side effects, except for one urticarial reaction.

J. M.

CUTANEOUS PENETRATION OF FATTY ACIDS. G. NEIS. (1960) *Derm. Wschr.*, **141**, 467.

These experiments were carried out in order to clarify the position with regard to the irritative properties of various types of soaps. Fatty acids of moderately long chains are notoriously irritant and lauric and stearic acids marked radioactively with C¹⁴ were tested. The autoradiographic results showed that the lauric acid actively penetrated the skin up to the subcutaneous tissue whilst the stearic acid only reached the so-called barrier layer (no further than the epidermis). This explains the different behaviour of fatty acids with medium and long chains.

J. M.

GRISEOFULVIN. G. RIEHL, K. HEKELE and A. LÖFFERER. (1960) *Derm. Wschr.*, **141**, 161.

A very optimistic report after treatment of 120 cases, mainly epidermophyton and trichophyton infections. Relapses occurred in 7 patients and the author feels that reinfection was the probable cause even in the 2 patients with nail infections. He stresses the importance of disinfection of shoes, stockings, gloves as well as bath mats, etc. Sixteen patients with tinea cruris (*E. floccosum* or *T. mentagrophytes*) responded quickly. Average duration of treatment was 3 weeks. One relapse after 4 months (after a surveillance of eleven months). Sixty-six cases of tinea of hands and feet are mentioned, 2 of which had also nodular lesions on the legs and 25 involvement of nails. Duration of treatment between 15-84 days. Clinical cure after 10-56 days. Sixty-four patients with onychomycosis were treated. Toe nails showed very much slower growth than finger nails. Dosage 1-2 g. daily to start with, later on 0.5 g. seemed sufficient. Treatment should be continued for some weeks after apparent cure; 28 patients are considered cured with no relapse so far. Duration of treatment between 3-7 months. On culture mainly *T. mentagrophytes* or *E. floccosum*; only rarely *T. rubrum* was found. Superficial trichophytosis of glabrous skin responded well on an average within 3 weeks and there was no recurrence after 11 months. Two cases of erythrasma and pityriasis versicolor as well as candida infections were not influenced. The authors wonder whether primarily resistant strains of fungi will be found in future or whether resistance might develop in sensitive species after treatment.

J. M.

POTASSIUM TELLURITE IN THE CULTURE OF DERMATOPHYTES. F. HAUF. (1960) *Derm. Wschr.*, **141**, 171.

Potassium tellurite was added to the medium instead of antibiotics whilst cycloheximide was only used if gross contamination with moulds was expected. *Sporotrichum schenckii* could not be identified on potassium tellurite medium as the fungus showed the same morphological characteristics as moulds. Media without any addition should perhaps be used if an unusual mycosis is suspected.

J. M.

ARTERIAL PRESSURE AND VENOUS LEG ULCERS. R. SCHMITZ. (1960) *Derm. Wschr.*, **141**, 188.

Arterial hypertension has no causal connection with stasic ulcers. It appears however that the blood pressure in patients suffering from the post-thrombotic syndrome will increase more with increase in age than that of controls. Sustained arterial hypertension is considered to be responsible for slow response of stasic ulcers.

J. M.

IATROGENIC NECROSES. G. and I. BREHM. (1960) *Derm. Wschr.*, **141**, 217.

Two patients had repeated intravenous infusions containing noradrenaline and hypophysisin respectively as well as physostigmine, glucose and saline. Severe and extensive deep necrosis of the legs occurred in both instances. The authors stress the fact that after infusions of vasoconstricting substances, particularly in distal parts of extremities, these serious complications can occur.

J. M.

DERMATOMYCOSES AND ABNORMAL PERIPHERAL CIRCULATION. N. KLÜKEN. (1960) *Derm. Wschr.*, **141**, 224.

The author is unable to confirm whether fungus infections are more common in patients suffering from vascular or circulatory abnormalities.

J. M.

GRANULOMATOSIS (TUBERCULOIDES) PSEUDOSCLERODERMIFORMIS SYMMETRICA CHRONICA (GOTTRON) (GRANULOMATOSIS DISCIFORMIS CHRONICA ET PROGRESSIVA (MIESCHER)). W. GERTLER. (1960) *Derm. Wschr.*, **141**, 241.

First described by Gotton in 1934. The author feels that it belongs to the concept of necrobiosis lipoidica (diabeticorum) and the histological picture shows transitions between these two conditions. The cause is probably nutritional and whether granulomatosis or necrobiosis will follow depends on the degree of circulatory disturbance, susceptibility of the connective tissue and reactivity of the reticuloendothelial system.

J. M.

A CONTRIBUTION TO THE THERAPY OF DERMATOMYCOSES. E. KAEMMERER and W. HAUCK. (1960) *Derm. Wschr.*, **141**, 297.

Recurrences of fungus infections of the feet are mainly due to reinfection from shoes. An efficient method of "cold sterilization" is described in detail. Ethylene oxide is used for one hour and sufficient airing of the footwear thereafter is essential.

FAMILIAL FAVUS OCCURRING IN SAXONY FOR FOUR GENERATIONS. O. FUCHS. (1960) *Derm. Wschr.*, **141**, 301.

Nine cases are described and the first case was traced back to the year 1890. The author agrees that the infectivity is limited (none of the husbands or contacts outside the family contracted the disease). He feels however, that infants and young children are particularly susceptible. Three patients had also nail involvement. Favus seems to become less active after puberty and there appears to have been a spontaneous cure in one female patient at the age of 23. All contacts should of course be examined and treatment instituted if possible simultaneously. X-ray epilation is probably inevitable and should be combined with the use of fungicides and manual epilation in small areas of recurrence. Griseofulvin therapy was not tried.

J. M.

EXTERNAL SUBTOTAL NASAL PLASTIC REPAIR. S. LIMBERGER and H. NÖHRICKE. (1960) *Derm. Wschr.*, **141**, 345.

The main indications are larger hairy naevi, deeply embedded foreign bodies, sequelae of lupus vulgaris particularly the malignant, epitheliomata (especially where radiotherapy is difficult to employ or likely to produce necrosis of cartilage or bone or indeed after unsuccessful radiotherapy) and suspicious lesions arising at the site of radioatrophy. The skin from the pinna is very suitable but is often liable to become necrotic. Preliminary cooling of the donor site with ice compresses for 14 days improves the chances of survival of the skin to be transplanted.

J. M.

TUBERCULOSIS CUTIS LUPOSA AFTER B.C.G. INOCULATION. J. MEYER-ROHN and R. BÖNICKE. (1960) *Derm. Wschr.*, **141**, 353.

A lupus nodule appeared on the thigh of a 14-year-old boy. The lesion ulcerated with subsequent tuberculosis of the regional inguinal lymph glands. Tubercle bacilli were isolated and confirmed to be of the B.C.G. species (using Bönicke's method of identification).

J. M.

MULTIPLE RETICULOHISTIOCYTOMATA OF THE SKIN IN A FEMALE PATIENT WITHOUT RHEUMATOID ARTHRITIS. D. WALTHER and E. SCHEICHER-GOTTRON. (1960) *Derm. Wschr.*, **141**, 485.

The patient was 66 years old and the nodules affected mainly the abdomen, chest and back. The authors give a detailed account of the investigations and histology which was followed up over 15 months (4 biopsies of abdominal lesions were taken at intervals). There was no evidence of rheumatoid arthritis but the clinical picture and investigations suggest an inflammatory or toxic cause possibly of hepatic origin. Histologically the development of xanthomatous nodes and their slow involution is described.

J. M.

ERYTHEMA ELEVATUM ET DIUTINUM IN MOTHER AND DAUGHTER. H. LANGHOF and R. ZABEL. (1960) *Derm. Wschr.*, **141**, 496.

A housewife aged 45 years and her daughter aged 10 have been under observation since 1952. This seems to be the first example of mother and daughter recorded and appears to be morphologically of the Bury type (similar to the description given by H. Haber, 1955, *Brit. J. Derm.*, **67**, 121). The child suffers from polyarthritis and the mother from ulcers of the oral mucous membrane. The serum cholesterol values were high and new lesions appeared with increased antistreptolysin titre. At the same time the polyarthritis seemed to deteriorate in the daughter. Chloroquine sulphate therapy appeared to be beneficial (the daughter's skin and arthritis improved). Therapy will have to be continued over a period of months. The authors feel that this condition is probably the cutaneous manifestation of an allergic vasculitis which can also affect the joints, the spongiosa of the bones, the bone marrow and possibly also the liver and lungs. The mother's eyes were enucleated because of bilateral glaucoma and she had several abortions and stillbirths and the authors wonder again whether ocular and placental vascular changes might not be responsible.

J. M.

TRICHOPHYTIA PROFUNDA BARBAE CAUSED BY T. RUBRUM AND ITS EPIDEMIOLOGY.B. ETTIG. (1960) *Derm. Wschr.*, **141**, 517.

Two cases of this rare condition are described. The microflora in "natural" soil samples inhibits germination of the *T. rubrum* conidia. *T. rubrum* is therefore not a soil fungus and not even a saprophytic phase is feasible.

J. M.

A CONTRIBUTION TO THE PROBLEM OF THE HOSPITAL STAPHYLOCOCCUS.O. BERKOVEC and J. GRANITS-THURNER. (1950) *Derm. Wschr.*, **141**, 522.

This is an up-to-date report on the resistance to penicillin, streptomycin, tetracycline and chloramphenicol.

Microbes cultured from hospital personnel and healthy individuals (mainly patients who attended the Outpatient Department for cosmetic advice and who have not had any contact with the hospital) were compared.

Hospital staphylococci were more resistant to penicillin and streptomycin. The sensitivities against the broad spectrum antibiotics appeared to be the same.

J. M.

EXTERNAL AND INTERNAL THERAPY OF THE ACNE SYNDROME.W. SEVIN and H. DIETZ. (1960) *Derm. Wschr.*, **141**, 565.

Abnormal androgen production, foci of infection, possibly abnormal bacterial flora as well as the seborrhoeic background are important aetiological factors. About 50% of the adolescent dermatological inpatients were suffering from acne vulgaris, and about 6.5% of all the female patients and nearly 5% of the male outpatients attending the clinic showed signs of this disorder. It is often possible to substitute physiotherapy by washing the affected parts daily with hot water for 10-15 minutes. Or soft soap should be applied, left for 10 minutes and washed off with hot water followed by a cold wash. Proprietary preparations Akne-medice-lotion (containing phenol, glycerine, salicylic acid, resorcin and camphor in isopropyl alcohol) as well as powder (colloidal sulphur, red oxide of mercury, tannic acid etc.) were found to be useful. The bacterial component will not respond to antibiotics and the authors recommend autogenous vaccine. U.V.L. has its place but given indiscriminately may lead to premature ageing of the skin. X-ray therapy (50 r repeated every 5 days up to a total of 300 r at 60-70 Kv) is useful particularly in acne indurata and conglobata. Vitamins in daily doses of 150-200,000 units of vitamin A and 100 mg. vitamin E up to a total dose of 6 million units of vitamin A and 2-2.5 g. of vitamin E are sometimes given. Ovarian dysfunction and uterine hypoplasia are often found in the female acne sufferer and simultaneous injection of chorionic gonadotropin and autogenous vaccine are recommended: 500 units of chorionic gonadotropin are given twice or three times between the 15-24th day of the cycle and this routine being repeated over several cycles.

J. M.

INTRAFOCAL STEROID THERAPY IN DERMATOLOGY.H. DIETZ. (1960) *Derm. Wschr.*, **141**, 589.

Nearly 150 patients were treated during the past 3 years. About one third of them (the earlier cases) were given hydrocortisone crystalline suspension (25 mg./ml.) and the remainder prednisolone acetate suspension (10 mg./ml.). Treatment was carried out without local anaesthetic when prednisolone was used and repeated every 10-14 days. 1 ml. was sufficient for a field of 5 square cm. A single dose of prednisolone was between 2-20 mg. and the average total dose about 40 mg. Thirty-six patients with keloids were treated. Eleven were improved, chiefly lesions of comparatively short duration (mainly acne and postoperative keloids). Five out of 6 patients with chondrodermatitis nodularis helicis responded well, and annular or nodular lesions of sarcoidosis were also improved. Resistant lupus vulgaris may also respond and very good results were achieved in hypertrophic lichen planus and above all granuloma annulare.

J. M.

THE CULTIVATION OF DERMATOPHYTES ON THE AIR CELL MEMBRANE OF THE HEN'SEGG. A. C. BORSTLAP. (1960) *Arch. Derm., Chicago*, **81**, 506.

In a series of experiments involving the use of 304 eggs it was found that dermatophytes grew better on the air cell membranes of hard boiled eggs than of raw eggs and at a temperature of 25° C. than at 37° C. The macroscopic appearances were the same as those of cultures of the same age grown on Sabouraud's glucose agar.

J. K.

LICHEN PLANUS-LIKE ERUPTIONS CAUSED BY A COLOUR FILM DEVELOPER. EDWARD H. MANDEL. (1960) *Arch. Derm., Chicago*, **81**, 516.

A series of 11 patients, 9 of whom had lichen planus-like eruptions and 2 typical contact dermatitis, were found sensitive to a single colour developing agent, CD2 (2-amino, 5-diethyl-amino-toluene monohydrochloride). This agent acts as an allergen rather than as a primary irritant and in one case in which a patch test was done to paraphenylenediamine this was found to be positive.

J. K.

THE EFFECT OF DIETARY FAT IN IDIOPATHIC HYPERLIPAEMIA WITH XANTHOMATOSIS.

FREDERICK A. J. KINGERY, PAUL R. WINDER, WALTER D. BLOCK and ARTHUR C. CURTIS. (1960) *Arch. Derm., Chicago*, **81**, 523.

A study lasting 39 days was made on a patient suffering from idiopathic hyperlipaemia with xanthomatosis. During this period he was fed on normal hospital diet for 9 days, then a diet in which the main source of fat was safflower oil for 11 days, normal diet for 9 days and a diet in which the fat was mainly coconut oil for 11 days. The patient maintained weight during the experiment but the total lipid content and total cholesterol content of the serum fell to a marked degree during the period of taking safflower oil in the diet. Safflower oil contains large amounts of unsaturated fat.

J. K.

TREATMENT OF PSORIASIS WITH SUBCUTANEOUS INFILTRATION OF TRIAMCINOLONE DIACETATE SUSPENSION. ARPAD G. GERARD. (1960) *Arch. Derm., Chicago*, **81**, 535.

Subcutaneous infiltration of lesions of psoriasis with triamcinolone acetate even as weak as 1.25 mg. per ml. caused disappearance of the lesions and there was no recurrence after 4 months. Similar infiltration with hydrocortisone acetate also caused disappearance of the lesions but there was usually recurrence after 2 weeks. Intradermal injection of triamcinolone cleared up a very small area and recurrence was invariable.

J. K.

DIFFUSE ALOPECIA IN WOMEN: ITS UNEXPLAINED APPARENT INCREASE IN INCIDENCE. MARION B. SULZBERGER, VICTOR H. WITTEN and ALFRED W. KOPF. (1960) *Arch. Derm., Chicago*, **81**, 556.

The writers' impression was confirmed by over 50% of replies to a questionnaire sent to North American dermatologists, and similar views have been expressed in certain European countries. Diffuse alopecia in women has increased and no satisfactory explanation has been suggested.

J. K.

GRISEOFULVIN AND DERMATOMYCOSES: AN INTERNATIONAL SYMPOSIUM SPONSORED BY THE UNIVERSITY OF MIAMI. (1960) *Arch. Derm., Chicago*, **81**, 649.

(This symposium, consisting of 38 papers, takes up 234 pages. It is not considered practicable to abstract individual papers so an abstract of the symposium in general is given.)

There are several papers on laboratory investigations, including electron microscope studies of the effect on fungi of griseofulvin. It has been found that *in vitro*, dermatophytes can become resistant to the drug but this has not been observed clinically. A single intramuscular or subcutaneous injection of griseofulvin in oil (500 mg. per Kg.) was as effective in guinea pigs as normal oral administration. It has been confirmed clinically and experimentally that side effects are few and not serious with oral griseofulvin even in doses many times greater than normal, but when given parenterally in large doses (e.g. 200 mg. per Kg.) mitosis was interfered with and spermatogenesis affected. Unfortunately such action was not effective in controlling experimental tumours.

Clinical reports are similar to those already published and confirm the good results obtained with griseofulvin. Attempts at short-term treatment of onychomycosis were not successful enough to warrant its further use in this way. Tinea pedis tended to relapse on stopping griseofulvin and a combination of local treatment with oral griseofulvin gave better results.

Clinically, sporotrichosis reacted well to griseofulvin as did mycetoma due to *Nocardia brasiliensis*. Response was poor in chromoblastomycosis. One case of deep granulomatous trichophytosis was apparently completely cured by griseofulvin. Griseofulvin was without effect in treating mice infected with *Histoplasma capsulatum*, *Blastomyces dermatitidis*, *Cryptococcus neoformans* or *Coccidioides immitis*.

J. K.